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Feasibility Study for Joint Military-Civilian Use of Scott Air Force Base

Final Report
May 1986

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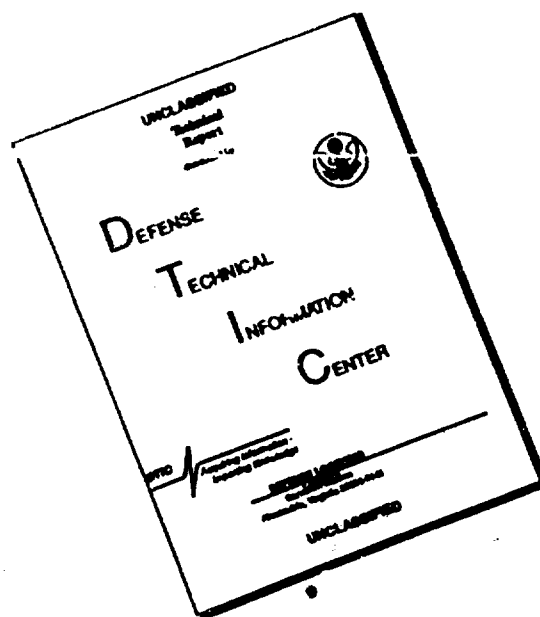
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PREFACE

The rebounding national economy and the drop in oil prices have made air transportation a growth industry again. However, there is increasing evidence that the industry's growth may be curtailed by a lack of airport system capacity. Lack of capacity in a region can, in turn, curtail commercial air service and limit the potential for future economic development.

A recent Memorandum of Agreement between the Secretaries of Defense and Transportation directed their agencies to undertake cooperative action to make better joint use of the nation's civil and military aviation resources. Although there are currently a number of joint-use airports in the U.S., it appears that increased joint use of existing installations could reduce costs and improve service.

Given this background, the Illinois Department of Transportation (IDOT) commissioned a study to determine the feasibility of providing supplementary air service to the southern Illinois area, including the greater St. Louis metropolitan area, by making Scott Air Force Base (AFB) a joint use facility.

St. Louis has been frequently identified as one of the major metropolitan areas that will not have adequate airport capacity to meet the forecast demand for air service in the post 1990 era. Starting with Lindbergh's "The Spirit of St. Louis", the region has a long tradition of being one of the nation's major aviation centers. To lose this eminent position would adversely affect not only St. Louis but would also harm ongoing efforts to improve the economic well being of the people living in southern Illinois.

Scott Air Force Base is a prime candidate for investigation as a joint use operation. Located on the perimeter of the St. Louis metropolitan area, with military air operations compatible with civil air operations, Scott AFB has the potential to synergistically contribute to both local and national goals. Joint use at Scott could relieve congestion at Lambert International Airport and simultaneously enhance the Air Force's capability to perform military missions.

The analysis in this report examines the germane issues, including:

- o The military aspects of proposed joint military-civil operations.
- o The interest of civil operators in operating at Scott in a manner that is consistent with military requirements.
- o The level of civil operations that would occur at Scott.
- o The pertinent technical, physical, environmental and economic considerations.
- o Sponsorship, economic benefits and financial considerations.

Executive Summary

The St. Louis region is a major passenger and cargo air transportation center. Lambert/St. Louis International has experienced rapid air traffic growth in the past 10 years. However, even with major construction programs, airline activity in St. Louis has begun to outpace capacity. With aircraft operations presently exceeding 1988 forecasts, supplemental airport capacity will clearly be needed if the St. Louis and Southern Illinois area is to realize its full economic potential.

Scott Air Force Base (AFB) affords an opportunity to contribute significantly to the economic development of the St. Louis and Southern Illinois area in providing this supplemental capacity. If Scott were made available for civil as well as military use, it would provide a much needed stimulus to the economy of Southwestern Illinois.

The recently announced Department of Defense/Department of Transportation policy supporting civilian use of military facilities has given impetus to the idea that Scott could serve an important component of the civil aviation market in the bi-state area.

The Illinois Department of Transportation (IDOT), after consultation with the Air Force, has determined that the feasibility of developing Scott for joint military and civil use should be explored. Accordingly, IDOT engaged IPAC, Inc. (a consulting subsidiary of Sears World Trade) and TAMS (architects, engineers and planners) to assist in this feasibility determination.

The principal findings of the IPAC-TAMS study are as follows:

Section 1 addresses military requirements. The Air Force is amenable to the concept of joint use. It appears that a well planned concept for joint use of Scott AFB, consistent with the criteria established for joint use operations, would be acceptable to the Air Force. Although an official Air Force position cannot be obtained at this stage, no obstacles which would foreclose joint use have been identified. The plan which evolves must support the integrity of the military mission while, at the same time, also meet civilian objectives for joint use. Accordingly, a continuous dialogue must be maintained with the Air Force while the project is being developed.

Section 2 deals with commercial airline interest in Scott as a joint use facility. This interest was assessed in the context of the changing configuration of the airline passenger and cargo industries. Cargo operators appear to be most likely to serve Scott in the short term and the possibility of locating a small package hub at Scott is particularly attractive. All-cargo carriers, especially those that operate to and from Asia, are also attractive candidates for use of the Scott facility. On the other hand, there seems to be no immediate prospect for the establishment of a new scheduled passenger carrier hub at Scott. Nonetheless, passenger service connecting Scott to airline hubs outside of St. Louis is a realistic possibility due to demand for airline service, economic development in the greater St. Louis area, and congestion at Lambert.

Section 3 reports on traffic volumes and the effects of deregulation on Lambert. Potential traffic in the St. Louis region is projected to exceed Lambert's physical capacity by

1990. Therefore, long term growth in passenger traffic in the St. Louis area is predicated on the development of supplemental capacity to meet the demand. If the demand is not met, air carrier growth rates will be constrained and will fall below the national average. Air cargo and small package express activity, vital to regional economic growth, will be similarly impacted.

Section 4 translates the air traffic projections of Section 3 into airfield and terminal requirements in 5 year increments to the year 2005. Although the existing runway at Scott theoretically has sufficient capacity to handle the projected aircraft operations through the year 2005, a new runway for civil traffic will be required in order to satisfy DOD military mission requirements. The development of other facilities is planned to minimize initial costs and to provide flexibility in meeting long range requirements.

Section 5 describes specific facilities required to handle the projected traffic. Alternative airfield configuration concepts were investigated and rated. A phased development is proposed which includes, in phase two, a new runway parallel to the existing one at a distance of 6500 ft. to the east and staggered so as to fit between highway I-64 on the north and the Southern Railroad to the south. The 6500 ft. separation is proposed in order to minimize adverse impacts on Silver Creek and the surrounding wetlands.

The first developmental stage includes the minimal improvements in the Scott facilities necessary to initiate early cargo operations. This stage envisions initial civil operations with the introduction of limited scheduled carrier and commuter operations. Access is provided from Route 4 and some runway pavement and taxiway construction is anticipated.

The second stage of development is substantial in that it includes construction of a new parallel runway and associated taxiways by 1995. The first major passenger terminal area and an airport access road from I-64 is also foreseen. Further expansion of cargo facilities and the construction of a general aviation facility east of the new runway with access to Route 4 also occurs in 1995.

The third (2000) and fourth (2005) stages project the additional development of facilities primarily to accommodate passenger traffic, estimated at 2.8 million passengers annually by 2005. While the year 2005 is the end of the 20 year planning horizon, a facility through the year 2010 is presented to show the long term potential of Scott AFB.

Section 6 presents the development schedule and associated costs. Following is a summary of costs, by stage of development, including contingencies and engineering.

Table 1-1
Development Schedule and Costs
(\$ million 1986)

	<u>Land</u>	<u>Access</u>	<u>Airfield</u>	<u>Terminals</u>	<u>Total</u>
Stage 1	4.8	4.8	42.9	21.5	74.0
Stage 2		6.5	106.3	35.0	147.8
Stage 3			36.5	49.1	85.6
Stage 4	—	—	<u>16.0</u>	<u>34.0</u>	<u>50.0</u>
Total	4.8	11.3	201.7	139.6	357.4

Section 7 describes the Scott airspace configuration and general air traffic control procedures and conditions. Departure and arrival tracks for a potential parallel runway

configuration and projected air traffic volumes are postulated. Ultimate airspace configuration and procedures will be determined by the F.A.A., which has given its preliminary indication that the proposed configuration of Scott runways can be integrated into the St. Louis terminal air space complex.

Section 8 examines surface access systems and recommends new on-airport roadways for civil users of Scott AFB. Scott is ideally located with respect to ground transportation in the St. Louis and Southern Illinois region. The existing ground transportation system to and from the Scott complex has sufficient capacity to accommodate substantial growth in the use of Scott AFB by travellers originating and terminating throughout the region.

Section 9 is a preliminary assessment of the potential environmental impact of the proposed development and projected traffic on the area surrounding Scott AFB. The airport configuration recommended by the study team represents a balance of environmental, required farmland, and operational considerations. For example, only 1,000 acres of prime farm land will be required in the recommended configuration, which is significantly less than other alternatives, especially where railroad re-routing would be required. A great deal of this farm land can be maintained or returned to productivity during and subsequent to construction.

Noise contours show minimal impact because aircraft tracks are over rural areas. The most significant impacts involve construction in the wetlands and flood plain of Silver Creek. Extensive earthwork, creek crossing structures and wetlands mitigation measures will be required, as will archaeological surveys.

Section 10 provides preliminary estimates of the economic benefits which would result from developing Scott AFB as a joint commercial and military facility. Direct and induced employment from construction will amount to over 10,000 man years, through the year 2005 resulting in a cumulative payroll of approximately \$250 million. An estimated \$180 million of construction material would also be required. Operation of the airport will provide an additional 39,000 man years of employment, with an estimated payroll of \$859 million. The development of a joint use facility at Scott is estimated to increase State and county taxes by \$40.9 million and reduce unemployment expenditures by over \$34 million through 2005. Business and personal travellers should save \$85 million cumulatively through 2005 in terms of time saved and reduced travel costs. Finally, the broader transportation benefits resulting from additional airport capacity will play an important, although non-quantifiable role in stimulating economic growth in the region.

Section 11 discusses airport sponsorship. A review of Illinois legislation, pertinent memoranda, DOD agreements, and interviews with knowledgeable individuals reveals that there are numerous options for sponsorship. The matrix in Section 11 portrays seven different kinds of ownership against nine criteria. Existing enabling legislation is sufficient to establish an appropriate authority to meet the requirements of the state of Illinois, the Department of Defense for joint use and the FAA for funding under the Airport Improvement Program (AIP). There are no clear advantages or disadvantages associated with alternative airport sponsors.

Section 12 evaluates the financial aspects of the airport. Annual expenses to cover airport operating costs and the debt service for capital expenditures will significantly exceed operating revenues through the year 2005. Federal funding should cover roughly 10 to 20 percent of the development cost

of the civil facilities. Some private financing and industrial revenue bond funding may also be available. However, under likely conditions, a significant share of construction costs will have to be financed by State and local agencies, probably through general obligation bonds. The alternative of not proceeding with the development will have an adverse economic impact on the St. Louis Region.

Section 13 contains conclusions and recommendations which are listed here.

Conclusions

1. It is feasible to develop Scott AFB for civil use in a manner that is acceptable to the U.S. Air Force.
2. There is sufficient potential civil air traffic demand to justify civil use of Scott. In view of the forecast airport system capacity in the St. Louis region, Scott has the potential of contributing significantly to the future economic growth of the entire region.
3. The economic benefits to Southwestern Illinois that could flow from civil aviation activity at Scott should justify state and local support, including local sponsorship.
4. The airport configuration proposed, consisting ultimately of a new runway and terminal complex east of the existing military facilities, is the best alternative to pursue at this time.
5. The location and staging of civil development is consistent with the objectives of maintaining separate civil and military facilities.
6. The development proposal is environmentally feasible, particularly from the standpoint of noise impacts. The potential impacts on the Silver Creek wetlands and

floodplains can be mitigated by appropriate engineering measures.

7. Scott is well-situated with respect to ground transportation, in the St. Louis and Southern Illinois region.
8. The civil facility will not be financially self sufficient in the foreseeable future. However, the cumulative economic benefits to the region are likely to exceed the project's costs.
9. The cost of developing and operating civil facilities at Scott is likely to be less than other alternatives, which offer equivalent capacity.

Recommendations:

- o Establish appropriate sponsorship for civil airport facilities at Scott.
- o Develop a joint use agreement with the U.S. Air Force.
- o Apply to the FAA for AIP funding of an airport master planning project which includes the necessary study activities supportive of an Environmental Impact Statement, public forums and a specific financing strategy.
- o Establish executive level communications with potential airlines corporate interests and the public, for the purpose of promoting civil use of Scott AFB. This should be supported by a comprehensive marketing prospectus.
- o Initiate necessary discussions aimed at establishing a bi-state Advisory Committee to coordinate Scott planning as an integral element of the regional airport system.

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Section 1 Scott Air Force Base and Joint Use

1.1 Background

The shortage of airport system capacity in the St. Louis region, the mandate from the Secretaries of Defense and Transportation to assess military bases for possible joint military and commercial use, and the ideal location of Scott AFB prompted the State of Illinois to approach the Air Force about the development of Scott AFB as a joint use facility. The Air Force indicated its willingness to consider joint use concepts developed by state authorities.

In order to determine whether military constraints would preclude joint use of Scott AFB, a thorough investigation of the various laws, regulations, policies and memoranda of understanding concerning joint use of Air Force facilities was undertaken. This investigation revealed no legal or regulatory constraints that would inhibit the Air Force from accepting a carefully developed and coordinated proposal for the joint use of Scott AFB.

1.2 Approach

In carrying out this portion of the study, TPAC staff met with over 20 individuals serving in the Department of the Air Force, the Air Staff and National Guard staff, Headquarters Military Airlift Command, and wing and tenant organizations, at Scott AFB. A list of the individuals interviewed, including names, positions, and addresses is attached in Appendix 1-1.

Subjects covered in the interviews included:

- o Long-range plans for Scott AFB and the implications of such plans for joint use;

- o Limitations on, and potential for joint use;
- o Types of civil facilities at Scott AFB which would best complement the military mission;
- o Restrictions which would be required to protect the integrity of the military mission at Scott AFB.

The areas which were stressed during the discussions basically paralleled the Criteria for Evaluation in the Plan for Joint Use of Military Airfields. An assessment of Scott AFB in light of these criteria is included in Section 1.6.

IPAC also reviewed the literature on joint use, including its history, Department of Defense policies and procedures, criteria for evaluating applications, facilities, U.S. Air Force requirements and existing agreements. Pertinent synopses and extracts from these documents are assembled in Appendix 1-2.

1.3 Background on Joint Use

Airports within the United States have become major national resources as the economic and national security importance of air transportation has increased. Reflecting this importance, military organizations today operate routinely and successfully from a large number of commercial airports and vice versa.

The post-World War II air defense system which placed interceptor aircraft at major commercial airports throughout the country is probably one of the best examples of co-mingling military and commercial operations. Chicago-O'Hare, the busiest airport in the United States, currently has both Air National Guard and Air Force Reserve units stationed at the airport. Four of the top 11 airports in total passenger

enplanements (including Lambert) have military units located and operating routinely at the airport. Three of the four busiest airports in terms of total aircraft operations, and 5 of the 13 busiest airports (including Lambert) have military units. While not "joint use" by the Department of Defense (DOD) definition, the impacts of congestion and divergent missions are not dissimilar.

The National Plan of Integrated Airport Systems (NPIAS), published every two years by the Federal Aviation Administration (FAA), is a plan to determine airport improvements necessary to accommodate current and forecast civil aviation requirements. Approximately 3,660 airports are included in this plan. Airports and their listed improvements are eligible for Federal financial assistance under the FAA's Airport Improvement Program (AIP). Under the AIP, over \$1 billion is spent annually to preserve and improve the essential airport resources identified in the plan. Of the 24 joint use facilities, 17 are included in the NPIAS.

Over the years the FAA has continuously coordinated with the DOD regarding military installations which may be available for joint use. A recent example is the 1984 Plan for Joint Use Military Airfields which the FAA and DOD jointly produced in response to a requirement of the Airport and Airway Improvement Act of 1982.

Improvements for military airfields are funded by the Military Construction Program of the DOD. In the case of joint use facilities, funds from either local or state sources or the Airport Improvement Program may be used to provide facilities for civilian and joint use. Neither direct nor significant indirect costs associated with joint use can be funded by DOD.

1.4 Current DOD Policy on Joint Use

The policy outlined in a Secretary of Defense Memorandum dated December 16, 1983 is the basis for determining the availability and suitability of airfields for joint use.

"The DOD determines the feasibility and extent of joint use at military airfields. The DOD will consider joint use when it does not compromise military response, security, readiness, or safety. Joint use of military airfields will be considered on a case-by-case basis when a formal proposal is submitted by a local government agency eligible to sponsor a public airport. Established criteria and good judgment will be used by the DOD when evaluating formal proposals."

This policy summarizes the DOD position on joint use and is the overall authority for the submission and subsequent evaluation of joint use requests. Extracts of pertinent portions of the DOD evaluation criteria are compiled in Appendix 1-2.

1.41 Existing Joint Use Agreements

In addition to the 24 domestic military airfields having joint use agreements, many other military airfields permit limited civil operations on a case-by-case basis in response to specific requests. Of the 11 Air Force joint use agreements, IPAC examined 6 in depth. Based on Headquarters USAF advice, Dover, Eglin, Myrtle Beach, Rickenbacker and Westover Air Force Bases were selected as the most representative joint use agreements currently in force. Extracts of these agreements are provided in Appendix 1-3.

1.5 Current Considerations at Scott AFB

All the discussions with Air Force personnel encountered a generally supportive reaction. While none could state an official position until the actual proposal has been received

and reviewed, the preliminary discussions indicated that the Air Force is, at the least, receptive to the proposition. In some cases, the individuals interviewed rapidly shifted the discussion to the potential benefits to the Air Force of a joint use agreement, as well as the benefits to Southwest Illinois.

Substantial construction activity has been undertaken at Scott recently, none of which has directly impacted the airfield. As of this report, there are 72 active construction projects. Rehabilitation of family housing is underway, and in the next year, a new headquarters building for the Air Force Communications Command will be constructed at a cost of nearly five million dollars. Consequently, the stability of major Air Force headquarters at Scott AFB is a virtual certainty for the foreseeable future.

Units and organizations at Scott AFB presently consist of two major air commands -- Military Airlift Command (MAC) and Air Force Communications Command (AFCC); two services -- Air Weather Service and the Aerospace Rescue & Recovery Service; the 23rd Air Force; the United States Air Force Environmental Technical Applications Center; the 375th Aeromedical Airlift Wing; the 932nd Aeromedical Airlift Wing (Associate) and an aviation battalion of the U.S. Army Reserve. Approximately 6,900 military and 3,700 civilians work in 900 buildings on 3,800 acres of land. Over 4,000 personnel reside on the base.

A total of 54 aircraft currently are assigned to Scott AFB: 11 C-9's, 10 C-21's (Lear 35A), 3 C-12's (Beech Superking), 4 C-140's, 26 UH1's and assorted general aviation aircraft associated with the Aero Club.

Traffic at Scott AFB is relatively low; approximately 3,300 operations per month. About 85 percent of this traffic occurs between the hours of 0600 and 1800. Historically, 75 percent of all Scott AFB control tower operations (which includes contacts of aircraft transiting tower controlled airspace) have been military.

The airfield facilities at Scott consist of a single runway oriented in a northwest/southeast (14-32) direction. The runway is 7,061 feet long and 150 feet wide, and hardened overruns at each end of the runway provide a total landing distance of 8,061 feet. Ramp space is approximately 144,000 square yards with some additional parking space available on former WWII runways which presently are used as taxiways.

Traffic control for Scott AFB is provided by Air Force operated tower and approach control facilities and the Federal Aviation Administration Kansas City Center.

Approach aids include a non-directional beacon to runway 32, ILS, tacan, and precision approach radar to runways 32 and 14, and helicopter non-directional/localizer 315°.

Prevailing winds for Scott AFB favor runway 32 active runway.

Seven other charted airports are located within 26 nautical (30 statute) miles of Scott AFB. These include Lambert on a heading of 291° for 27 nautical miles; St. Louis Downtown-Parks, heading 270°/15 nm; St. Louis Regional, heading 330°/22.5 nm.; Shafer Metro East 005°/10.5 nm.; Greenville 039°/28 nm.; Weiss 265°/28 nm.; and Sparta 160°/25 nm.

Lambert has precision approach ILS to runways 30L, 30R, 24, and 12R. St. Louis Downtown-Parks has an ILS to runway 30. St. Louis Regional has an ILS to runway 29. The primary .

instrument runways for Scott and 3 contiguous airports are thus within 30° of each other. Instrument operations are facilitated when closely grouped airports are using runways within a 30° alignment envelope. The combined total of instrument operations at the 4 airports with precision approaches was 57,413 for FY84. Lambert accounted for 84 percent of the total, Scott AFB for 11 percent.

There is limited geographic space within the existing Scott AFB boundaries to expand and improve aircraft parking aprons and runway operational capabilities. There are plans for airfield upgrade programs such as a new parallel taxiway and improved clear zones. Airfield improvements to accommodate commercial aviation, which would also enhance Air Force mission capability, would be attractive to the Air Force. Construction of additional runway(s), ramp space, and a terminal facility in an area which can be segregated from the current Scott facilities, were basic assumptions during the discussions with Air Force representatives.

1.6 Assessment of Scott in Light of Criteria for Evaluation

A discussion of Scott AFB in light of the Criteria for Evaluation contained in the Plan for Joint Use of Military Airfields follows:

1.61 Airspace/Air Traffic Control Criteria

Section 7 discusses proposed air space management. The Air Force will continue to man the tower and approach control facilities with Air Force personnel. Increased traffic will probably require a restructuring of the controlled airspace over and around Scott AFB. In the least this would occur at the time the new runway becomes operational. The current 3,000 foot control limit is unacceptable for both aircraft departures and arrivals. This is particularly true in the northwest

quadrant where there is a jurisdiction boundary with St. Louis Approach Control. The current jurisdiction lines form a less than 90 degree corner approximately 10 miles from the Scott AFB near the centerline extended for runway 32. Coordination must be made with St. Louis Approach Control on all air traffic within two miles of this jurisdictional boundary.

Military and government traffic, particularly the aeromedical airlift evacuation mission will take priority. With new runway construction, and controlled airspace adjustments, there should be no constraints on the levels of traffic or hours of operation.

1.62 Traffic Mix Criteria

The majority of the Air Force traffic will be jet or turbo-prop, along with some helicopter and aero club general aviation traffic. Student training in general aviation aircraft will probably be prohibited for other than Air Force aero club activities.

1.63 Mission Activity Criteria

All current and foreseen missions at Scott AFB appear compatible with joint use. While there is a considerable amount of Air Force training conducted at Scott AFB, it is of graduate pilots undergoing upgrade training in C-9, C-21, and C-12 aircraft. These aircraft, in civilian configuration, are the DC-9, Lear 35A and the Beech Super King. Flexibility for future force beddown and mobilization activities, as well as the training and aeromedical airlift missions and transient traffic flow, would be enhanced by improved facilities.

1.64 Civil Aircraft Equipment and Aircrew Qualification Criteria

Discussions indicate that military constraints on Instrument Flight Rules (IFR) qualified crews and aircraft would be difficult to impose due to the operation of the aero club at Scott. Two-way radios will be a definite requirement. Due to increased traffic and safety considerations, transponder capability could be a requirement.

1.65 Facilities Criteria

Crash and Rescue responsibilities will need to be addressed in detail. Specific provisions regarding liability, reimbursement, and Air Force option to remove crashed vehicles and equipment also will require thorough and detailed delineation.

1.66 Security

Civilian use of any existing facilities other than runway 14-32 and associated taxiways, will probably be prohibited. Security fencing, which abuts existing fencing, probably will be required. Access check point manning on perimeter roads and other locations, would entail reimbursement to the government, if the need is generated solely by joint useage of the field.

1.67 Manpower Criteria

Manpower impacts may occur in the functions of Security Police, Air Weather Service, and Air Traffic Control. Projected manning increases in all such areas should be provided by the Air Force, and a method of reimbursement will be required.

1.68 Financial and Environmental Criteria

There should be no special constraints on these items, other than the need to negotiate an equitable arrangement.

1.7 Conclusions

While no official Air Force position could be expected at this time, no major obstacles were identified regarding the Illinois Department of Transportation initiatives for joint use of Scott AFB.

A well planned development program, accompanied by a strong state and sponsor commitment, should support a viable joint use agreement. None of the criteria for evaluation would prevent joint use of Scott AFB.

Adaptation of the most appropriate wording from the five example agreements will provide an appropriate framework for initiating negotiations with Scott AFB officials.

BIBLIOGRAPHY

The Plan for Joint Use of Military Airfields Department of Defense, Department of Transportation, dated March 8, 1984

Joint Use Agreement Dover Air Force Base Delaware, dated 18 June 1982 as amended 8 December 1984 with supplement dated 4 March 1984.

Joint Use Agreement Eglin Main Base Area, Eglin Air Force Base, Florida dated 28 August 1972.

Joint Use Agreement Between the United States of America and Rickenbacker Port Authority, dated 21 January 1982.

Joint Use Agreement, Westover Air Force Base, Massachusetts dated 4 February 1981.

Joint use contract between the Horry County Airport commission and the United States Air Force, Myrtle Beach, AFB, dated 5 June 1975.

DOD Flight Information Publication (Enroute) IFR - Supplement, United States dated 26 September 1985.

Section 2 Potential Civil Use of Scott Air Force Base

2.1 General

Since the passage of the Airline Deregulation Act in 1978, the Federal government can no longer require carriers to serve specific airports as a condition for obtaining operating authority. Airports now must actively compete for the patronage of airlines. This is particularly true for airports outside of major metropolitan areas and secondary airports within major metropolitan areas. The accelerating concentration of the airline industry and the prospective mergers with a number of independent airlines - including two (Ozark and Air Midwest) with major operations at Lambert - reinforces the importance of understanding the forces reshaping the industry when assessing possible carrier interest in serving additional airports.

2.2 Methodology

To accurately assess the potential of Scott AFB as an airport for commercial airline operations, the impact of deregulation on the economics and underlying structure of the airline industry and its implications for the industry in the post deregulation era were evaluated. A representative sample of U.S. commercial airlines was then surveyed to determine: (a) what elements they consider when evaluating airports for possible introduction of new air operations; (b) their potential interest in serving Scott AFB; (c) critical requirements and preconditions for such services; and (d) if possible, the likely timing for introduction of such services.

The full range of air services was surveyed, including passenger airlines, combination operators, all cargo, freight forwarder and package express services. Several of the combination carriers own or control commuter airlines (e.g.

People Express owns Britt and PBA). Other combination carriers surveyed have contractual agreements with commuter airlines. In addition to U.S. airlines, IPAC contacted several Asian airlines, as well as U.S. government air service negotiators.

2.3 Scheduled Air Carrier Operations

Deregulation has had a profound impact on the structure of the commercial airline industry and will play a critical role in the potential civil use of Scott AFB. Of particular note is the growing use of hub and spoke systems by the major carriers and the emergence of associated commuter airlines. The recent history of deregulation and its implication for commercial air traffic are discussed in detail in Appendix 2-1.

In a deregulated environment, scheduled air carriers will shift to Scott AFB only if it is in their economic interest to do so. In the near term there will be little incentive to shift. TWA is in the process of acquiring Ozark and these are the only two airlines currently hubbing at Lambert. The prospect of another airline establishing a hub at Lambert is limited because of the current and forecast congestion.

Similarly, as discussed more fully in Appendix 2-1, other airlines are unlikely to establish a hub at Scott AFB within the time frame of this study. As a result, the potential for passenger traffic at Scott AFB is limited primarily to commuter airlines and the operations of a spoke from Scott to hubs outside the St. Louis area.

The development plan for Scott AFB, therefore, is predicated on only gradual growth in passenger traffic arising from increasingly severe congestion at Lambert.

2.4 Air Cargo Operations

Deregulation has also led to major changes in the air cargo industry, changes which significantly affect the prospects for attracting air cargo operations to Scott AFB. Traditional all-cargo airlines (e.g. Flying Tigers) have been faced with heightened competition from package express carriers, air freight forwarders, and deregulated truckers. In addition, the increase in passenger aircraft services permitted by deregulation and introduction of shorter range wide-body aircraft, has increased available belly-capacity, further depressing the prices charged by traditional cargo operators.

Despite the recent difficulties of traditional all-cargo carriers, however, a number of factors suggest a promising future growth for the air cargo industry.

The shift of major U.S. industries, such as auto manufacturing, to just-in-time production systems and off-shore sourcing, combined with the rapid rates of economic growth in the Pacific Basin - an area best served by air for many cargoes - leads most industry forecasters to project solid growth even for the traditional air cargo industry.

Due to its proximity to major U.S. industrial manufacturing centers, St. Louis could serve as a major cargo gateway between these areas and Asia. Asian carriers are clamoring for access to Chicago in order to reach these Midwestern industrial centers, but due to a combination of domestic political reasons, it is unlikely that the U.S. Government will permit them to serve Chicago for some time. Cargo carriers could use St. Louis as an effective alternative to Chicago, a possibility which has some appeal both for foreign airlines and U.S. Government negotiators. Lacking an airport with adequate space and facilities for a large all-cargo operation, however, St.

Louis is unlikely to attract such service. Unlike Lambert, Scott could provide the necessary space and facilities for such a cargo operation.

2.41 Small Package Express Carriers

Federal Express and its competition have revolutionized industrial inventory management and established business patterns, through the development of an assured next-day delivery for high value parts and documents. Freedom of entry has enabled carriers to establish efficiently sized hub and spoke systems which can economically provide a next-day service to widely dispersed markets.

For a variety of reasons small package express carriers require a centrally located hub to serve the entire U.S. market with next-day service. That is why Federal Express has a hubbing operation at Memphis, UPS at Louisville, Airborne Express and Emery in Ohio, and Purolator temporarily in Indiana.

Small package express hubs have several other characteristics differentiating them from passenger hubs. They have a high concentration of night operations, with peak activity between 10 p.m. and 4 a.m. Since broad market coverage is an essential competitive factor, carriers operate many small aircraft. They require both a substantial ramp area, to accommodate the large number of simultaneous loading and unloading operations, and a large well-designed sorting facility which is capable of handling peak volumes, while maintaining high (98+ percent) rates of arrival and departure reliability.

Although centrally located, Lambert cannot meet other requirements necessary to attract a small package express carrier hub. The establishment of a hub is today the key

factor in a region's ability to exploit the economic benefits of the growth in air transportation. (See Appendix 2.1 for a more extensive discussion of hubbing).

2.42 Freight Forwarders

The competition provided by vertically integrated (i.e. small package express) carriers and the new freedom to operate their own aircraft have also led to important changes in air freight forwarding, which could enhance the attractiveness of Scott AFB to freight forwarders. Since forwarders currently depend on belly capacity in passenger aircraft to provide a significant amount of their lift, forwarders must maintain operations at Lambert. But the strong trend for forwarders to operate their own aircraft could make Scott increasingly attractive as a centrally located site for a forwarder operated all-cargo hub connected to Lambert, as necessary, by truck.

2.5 Survey Results

2.51 General

Due to the competitive sensitivity of route selection information, most carrier executives would only speak candidly off the record. Thus the survey results are presented in a format designed to convey carrier views accurately, while protecting the confidentiality of individual comments. Additional information is contained in Appendix 2.2.

2.52 Passenger and Combination Carriers

No carrier in the survey was prepared to make a firm commitment to serve Scott AFB. This is not surprising, since few were even aware that Scott was being considered as a joint use facility. All indicated that more information about the

airport facility, area traffic, access, etc. would be required before they could seriously evaluate service to Scott. Nonetheless, most felt that delays at Lambert are a serious problem for passenger airlines, and that if delays at Lambert increase relative to competing hubs it will lose traffic revenues and jobs to alternate hubs at Kansas City, Chicago, Memphis, and Nashville.

Several passenger carriers also expressed some concern about facilities at Lambert, but none foresaw a shift of their existing Lambert operations to new airports. Most carriers felt they were too small at Lambert to move away from TWA and Ozark, the main traffic generators at Lambert. Furthermore, non-hubbing carriers in St. Louis want to be close to other carrier services because passengers, particularly business travelers, prefer airports with frequent services.

Nevertheless, airlines not hubbing at Lambert would consider serving Scott in addition to their existing services at Lambert. Scott would provide additional spokes into their existing hubs. If there is sufficient traffic potential, airlines felt that such services could provide carriers with an edge in competing with TWA/Ozark for passengers served more conveniently through Scott. This would tend to mitigate the service advantages enjoyed by TWA and Ozark at Lambert.

For several reasons, however, survey carriers felt that a new passenger carrier hub at Scott unlikely within the next decade. First, two strong carriers are already hubbing in St. Louis. If the TWA acquisition of Ozark is approved, a single stronger carrier will remain which is likely to discourage any attempts to establish a new hub in the St. Louis area. In 1984, TWA and Ozark accounted for 77 percent of Lambert traffic by certified route air carriers. Finally, St. Louis is

considered too far west of the major East coast population concentrations and traffic corridors to be a significant North-South mini-hub.

In evaluating possible operations at a secondary airport (such as Scott), the airlines surveyed consider a number of factors. Regional and local demographics and economics (i.e. age distribution of the population, income and buying power, proximity to the second airport) were of major interest to virtually all the surveyed carriers.

In addition, the amount of commercial service at the second airport is another crucial factor in evaluating possible operations - more is better. Carriers felt that greater public awareness of an airport (e.g. San Francisco International compared to Oakland) reduces the investment in public education and marketing which would be required to attract passengers. Also, the greater the availability and range of service, the more likely an airport is to attract business travelers, who prefer airports with multiple flights.

Finally, commuter carriers are becoming increasingly dependent on affiliations with major carriers. Therefore, any commuter service to Scott is likely to feed traffic to a hub outside of St. Louis, rather than to establish a hub at Scott. Also, local demand to Chicago could warrant frequent commuter service in the foreseeable future.

2.53 Cargo Operators

The cargo carriers surveyed felt that the adequacy of Lambert's cargo facilities for either an all-cargo or a small package express hub would be poor, with little realistic prospect for improvement. Therefore, Scott would be quite attractive to cargo operators seeking a Midwestern hub. Nonetheless, the symbiotic relationship between cargo airlines

and freight forwarders would affect the willingness of either independent of the other to locate at a new airport. Therefore, some joint location decisions may be required.

Carriers indicated that the major existing and forecast component of air cargo to and from the St. Louis area is auto parts. This traffic is expected to grow as the U.S. auto industry adopts more just-in-time production arrangements and off-shore sourcing. In this context, Scott is considered to be well-positioned to provide rapid air and truck cargo delivery services to a wide area of the U.S. industrial heartland. It could also provide an excellent alternative to Chicago O'Hare for some cargo traffic. In addition, there may be some U.S. Government interest in opening a midwestern cargo gateway, other than O'Hare, to Asian airlines.

Based on IPAC's survey, a small package express hub at Scott is a distinct possibility. The rapid growth of the small package express industry has created a need for additional hubs and Scott's central location makes it a potentially attractive candidate. UPS has recently been exploring alternative midwestern hubs, while others (e.g. Purolator, Airborne, Emery) have recently established midwestern hubs.

No carrier surveyed believes that Lambert can accommodate a small package hubbing operation. Therefore it is clear that without adequate cargo airport facilities, the St. Louis-Southwestern Illinois region will not be able to obtain the economic benefits generated by these hubs. However, due to its proximity to the westwardly expanding St. Louis metropolitan area, Lambert services would permit later package pick-up times for carriers with small package hubs outside of St. Louis.

Forwarders expect to continue using all-cargo carriers, but they will significantly increase their own aircraft operations

(e.g. Emery, Burlington). Lambert provides forwarders with excellent belly space access for passenger aircraft to many markets. Nonetheless forwarders could serve Scott through off-airport forwarder operations. Even if they remained at Lambert, good service and rates at Scott would induce forwarder participation there, as well as Lambert. Access to adequate ground-side, terminal, and warehouse capabilities could also encourage forwarders to locate major facilities at Scott.

2.54 International

Air cargo traffic growth across the Pacific is projected to increase at an annual rate of 9 percent through 2000 (as opposed to 4 to 5 percent per year in the U.S.), and the carriers foresee auto industry out-sourcing as a major source of demand, which could be served via the St. Louis area. Foreign cargo carriers (particularly Asian) have been seeking access to the Midwest in order to serve major industrial customers' Asian sourcing requirements.

Automobile assembly plants and auto parts manufacturers have already begun a move to the Illinois region. The Diamond-Star facility (Chrysler and Mitsubishi) at Bloomington Normal and the Canadian firm, Magna, International at Nashville are two prime examples. Automobile industry impacts are discussed further in Section 10.

2.6 Summary of Findings

2.61 Cargo operators are most likely to serve Scott in the short term.

- o A small package hub is the most likely service to be attracted to joint-use facilities at Scott AFB in the shortest time. Some carriers are actively seeking hubs, and the relocation of a small package hub is a

self contained decision not dependent on forwarders or other cargo operators.

- o All-cargo airlines could be attracted to a joint use facility Scott AFB. The basing decision of all-cargo airlines is affected by forwarder locations, support facilities, and road access.
- o Growth in air cargo, particularly to and from Asia, creates a market opportunity for Scott as a gateway to the large Midwestern industrial markets.
- o Since hub locations tend to be permanent, and since most are already located, finding a cargo operator (probably small package) as an "anchor tenant" should be a top priority. Development of Scott AFB can be tailored to meet the needs of the "anchor tenant", with subsequent development timed to meet emerging demand in the St. Louis and Southern Illinois region.

2.62 Passenger Traffic Opportunities at Scott are limited.

- o There seem to be no immediate prospects for the establishment of a new passenger carrier hub at Scott.
- o Passenger service connecting Scott to other carrier hubs is a realistic possibility, and is spurred by the congestion at Lambert.
- o Passenger service could be encouraged by area economic development initiatives, and by marketing the airport (and surrounding area) to the airlines.

Section 3 Forecasts of Aviation Activity

3.1 General

The changing airline industry described in the previous section has had a significant impact on the St. Louis Metropolitan Area and the future of the St. Louis Airport System. This section examines existing and forecast passenger and cargo traffic in the St. Louis region. Appendix 3.1 examines the patterns of growth and traffic distribution at Lambert as well as projections for future growth.

Historically the growth of the airline industry in a specific location followed a relatively predictable pattern. A study of the demographics of the region usually provided a fairly clear picture of the airline market potential. The regional population base, disposable income, age of the population, industry and retail sales base, gave planners a strong sense of direction for the future. This predictability has decreased sharply since deregulation. Today, the selection of an airport as an airline "hub", and a particular airline's success in the deregulated marketplace are more important in forecasting airport-specific traffic levels than traditional economic and demographic tracking.

In developing a plan for the future use of Scott AFB by both military and civil aircraft, it is necessary to determine the future demand for civil air operations in the Southern Illinois region and to ascertain what elements of the demand could best be accommodated by expansion of Scott AFB. Several major constraints were considered, including (1) military requirements and compatibility, (2) mitigation of potential adverse environmental impact (3) ground access from potential traffic sources and (4) inter-relationship of the Scott complex with the other airports in the Region.

3.2 Forecasts

Section 3.2 presents and explains in some detail the study team's forecasts for passengers, cargo and general aviation traffic at Scott AFB.

Table 3-1 summarizes, in 5 year increments, the traffic forecasts for a joint use facility at Scott AFB from 1990 through 2005. Table 3-3 at the conclusion of this section provides the traffic forecast by year.

Growth in passenger traffic reflects both the existing constraints at Lambert and the convenience of Scott for many travelers in the Southwestern Illinois/St. Louis region. Growth in cargo and package express operations reflects the anticipated establishment of cargo hubbing operation(s) at Scott.

3.21 Commercial and Commuter Air Carrier Passenger Demand

Comparison of the FAA forecast air transport demand in the St. Louis hub with the capacity of the airport shows that Lambert Airport is rapidly reaching saturation. Air transportation activity and its corresponding economic benefits will be lost to the St. Louis region unless additional facilities are provided for passenger and freight traffic.

The need for additional capacity in the St. Louis area has been documented by the FAA and others. In 1984 Lambert's total aircraft operations ranked 7th in the United States. By 1990 it will drop to 9th and by the year 2000 to 13th. The FAA has forecast severe congestion will exist within the 1985 to 1990 time frame. Additional service from new entrants into Lambert will be restricted.

AIR TRAFFIC FORECASTS BY YEAR
Scott AFB Feasibility Study

<u>TRAFFIC FORECASTS</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
<u>Passengers</u>				
<u>Total Annual</u>	121,000	381,000	1,464,000	2,810,000
Air Carrier	115,000	360,000	1,400,000	2,700,000
Comuter	6,000	21,000	64,000	110,000
<u>Peak Hour Explained</u>	90	180	285	475
Air Carrier	80	150	225	400
Comuter	10	30	60	75
<u>Operations</u>				
<u>Total Annual</u>	52,500	61,500	106,700	148,700
Air Carrier	1,200	3,600	14,000	25,000
Comuter	600	1,200	3,000	4,000
Package Express	9,000	13,200	30,200	45,000
All Cargo	1,200	1,800	3,000	4,200
General Aviation		1,200	16,000	30,000
Military	40,500	40,500	40,500	40,500
<u>Peak Hour</u>	18	22	30	40
Air Carrier	2	4	6	10
Comuter	2	4	6	6
Package Express	10	20	30	40
All Cargo	2	3	4	5
General Aviation	-	2	6	12
Military	14	14	14	14

Notes:

- Peak hour total does not equal sum of peaks.
- Annual military includes 25,000 touch and go (12,500 operations when counted as one operation per touch and go). Military ops. occur weekdays, primarily.
- Cargo/Package Express operate 7PM-7AM, peak hr. cargo = 500 daily, express = 300 daily.
- Peak hour for 2000, 2005 consists of package express departures.

TABLE 3-1

According to FAA, at the end of Fiscal Year 1985, there were 57 commercial airlines engaged in scheduled domestic air service. Of this total, 19 were carriers that had been certified prior to deregulation. The 38 new carriers accounted for 22 percent of the total domestic departures. Passenger enplanements increased 11.2 percent in 1985 over 1984, a rapid recovery from a dip in volume from 1980 to 1982. The latest FAA forecast for scheduled air carrier enplanements indicates a national domestic growth from 330 million in 1985 to 550 million in 1995.

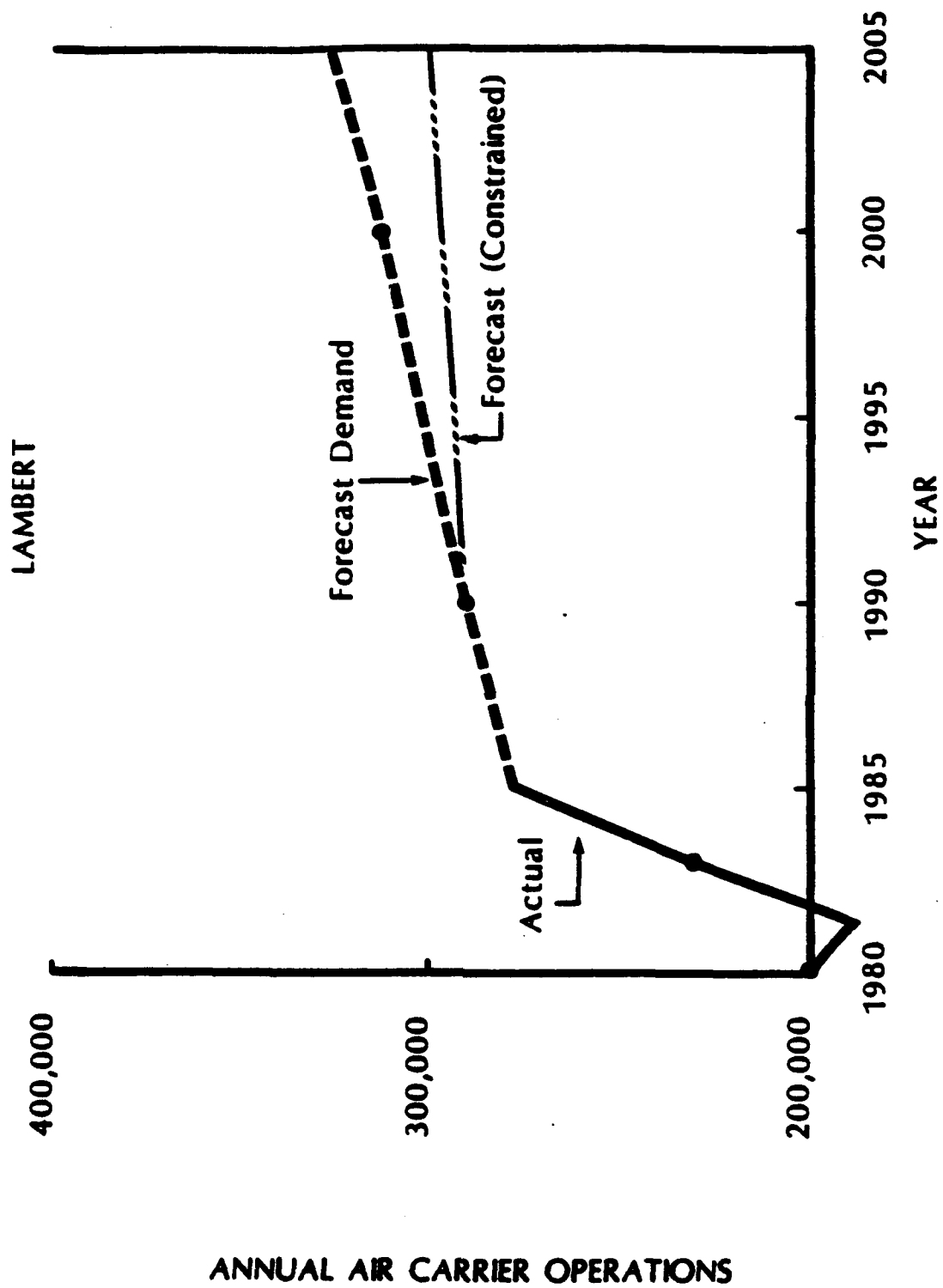
Constraints at Lambert are severe enough that FAA growth forecasts show Lambert's annual air carrier growth to be less than the national average (see Table 3-2).

Table 3-2
Forecast Air Carrier Growth Rates
(1985-1995)

	U.S. <u>AVERAGE</u>	<u>LAMBERT</u>
Passenger Enplanements	4.5%	3.0%
Aircraft Operations	4.1%	2.1%

This table shows that FAA forecast demand for St. Louis is limited beyond the year 1990. The "gap" between potential growth and available capacity, is shown in Figure 3-1.

In summary, the forecasts for passenger growth at Scott are based on two principal assumptions. (1) There is insufficient demand to create a third carrier hub in the St. Louis region during the planning period and (2) there is insufficient capacity at Lambert to meet forecast demand.



LAMBERT OPERATIONS FORECAST

Figure 3-1

TAMS
3/86

Scott AFB is logical location to provide the additional capacity to meet unfilled demands. The difference between the Lambert capacity through the year 2005 and the forecast potential has been assigned to Scott. Starting at a modest 4 flights per day in 1990, operations are projected to increase to an average of 70 flights per day, in 2005. This growth does not anticipate the establishment of a new passenger hub. Growth as a result of greater economic expansion which is considered likely to occur in the vicinity of Scott as a result of the availability of air capacity is likewise excluded. The operations forecast is based solely on providing capacity to meet FAA's forecast demand (extrapolated) for the St. Louis Hub.

From the annual forecasts of operations, fleet mix, passenger volumes, and peak hour operations were derived. An initial load factor of 60 percent in 1990 increasing to 65 percent in 2005 was used to calculate the number of enplaned passengers using Scott. These load factors are consistent with national trends.

The methodology to determine fleet mix incorporated a review of air traffic samples at Lambert during the years 1978, 1980, 1983, and 1986. These studies reveal the growth in the numbers of cities served directly from St. Louis from domestic cities has grown from 70 in 1978 to 82 in 1986. Scheduled arrivals and departures were similarly increased from approximately 300 per day (including commuter operations listed in the Official Aviation Guide) to 550.

93 percent of the 1986 scheduled operations were performed by 2 and 3 engine narrow-bodied aircraft in 1986 as compared to 84 percent in 1978. The increase was due to the almost complete elimination of the 4 engine narrow body aircraft in 1986. The future fleet mix of Scott extended these trends,

tempered by changes in the FAA forecast for the total domestic fleet.

The number of enplaned passengers were determined by an arithmetical calculation of operations, fleet-mix capacity and load factor.

Peak hour air carrier operations were derived from annual operations. At very low activity levels such as are forecast for 1990 (4 per day). It is expected that 50 percent of this traffic will occur in the peak hour, one landing and one takeoff, carrying 80 enplaned passengers. As traffic grows, peaking characteristics change. By 1995, with 20 operations per day, the peak hour operations reduce to 20 percent or 4 per hour, in 2000 to 6 percent and 10 percent in 2005. These peak hour operations are based on a spreading out of the traffic, but at the same time recognizing the traditional morning and evening peaks characteristic of all transportation modes.

According to the FAA, commuter traffic is expected to grow at an average annual rate of 8.7 percent during the next decade. Scott appears to be an ideal location to initiate service for new commuters as the air base provides an initial source of passengers who travel extensively. The long ground travel time to Lambert adds to the attractiveness of, for example, a Scott-Chicago operation in the initial phase of civil operations. During the planning period additional commuters are expected to be added to serve carrier hubs outside of St. Louis. Major carriers are increasingly relying on joint commuter-carrier combinations, e.g., The "American Eagle," "Delta Connection," "Eastern Express," and "Allegheny Commuter" to move traffic from low density routes into their existing hubs. The forecast for commuter growth at Scott reflects this trend. Commuter load factors, traditionally

lower than the scheduled carriers, have been fixed at 50 percent with aircraft seat capacities increasing from 20 in 1990 to 55 in 2005. The increase in aircraft size is comparable to national trends.

Additional capacity has traditionally been achieved by increasing the size of aircraft, but this trend now appears to have reversed with frequency of service becoming more important. Thus, the average commercial aircraft size, nation-wide declined by one seat in 1985 over 1984. The FAA states that "it also appears that the average aircraft size for the post deregulation carriers may have reached the optimum size."

The FAA is currently updating its air traffic control system and introducing new systems such as MLS to replace the ILS. Only marginal gains in airport capacity are anticipated from these new systems. Little or no runway and no additional terminal (land side) capacity will result from the FAA program. The upgrading will, however, provide for more flexible terminal air space management, thus reducing the possibility of interference with increased activity at Scott and the other satellite airports in the St. Louis Region.

The forecasting for Scott does not envision that general aviation traffic will be diverted from Lambert or any other airport in the St. Louis region. Consequently, the forecast does not include any appreciable general aviation activity other than the flying club presently operating under military control until the year 2000.

3.22 Small Package Express Operations

In examining the feasibility of the use of Scott AFB for civil use, each segment of civil aviation growth was viewed

separately. The fastest growing market in aviation today is the small package carrier. There are currently (1985) 19 small package operators in the United States reporting a total annual volume of 176 million packages, a growth rate of 27 percent over 1984.

Due to its geographical location, the St. Louis area is a logical gathering point for a small package operation. The industry survey indicated that St. Louis would be considered a likely hub for a small package operation except for the fact that the physical layout and congestion at Lambert make it impractical or impossible. Scott does not suffer from such limitations and the study team believes that a small package hub could begin at Scott when adequate apron and processing facilities are available.

The package express carriers forecast for Scott recognized that to be economically viable, a package express service must cover a substantial number of destinations. This reflects both the economies of scale of a hub operation (described in Appendix 2.1) and the substantial marketing advantages in offering shippers "one-stop-shopping" for all their package delivery requirements. Thus, the forecast is based on an initial small package network of 15 cities.

Using the growth patterns established by other small package operations as a model, the forecast anticipates that (1) the operator will start operations with used turbo-prop aircraft gradually converting the fleet to used jet aircraft and expanding the network as traffic grows and (2) the operations will be conducted at night with landings and take-off highly concentrated in short periods of time, hence an initial peak hour operation of 10 per hour growing to 40 per hour by the year 2005. Thus, both in terms of initial service levels and growth rates, the forecast is very conservative.

3.23 All Cargo Operations

Growth in all cargo operations, on a world-wide basis has been rapid. In 1975 4.8 billion ton-miles were flown in the scheduled system. By 1984 this had risen to 6.6 billion.

The distribution of air cargo, particularly automobile parts from the Orient for "next day delivery" provide a strong nucleus for the initiation of a cargo facility. The forecast envisions that such an operation would start with one U.S. carrier and one foreign carrier, each operating 5 flights per week. Since the Scott runway can now accommodate large transport jet freighters, initial construction costs would be minimal. Expansion of international air cargo operations at Scott from 10 flights per week to 40 flights per week in the year 2005 is predicted.

The small package express activity would be enhanced by a new international cargo facility to serve a large geographic region than just the St Louis area. The forecast for all cargo operations at Scott is based on new cargo missions which cannot be accommodated at Lambert.

3.24 Forecast Summary

The phased development plan, the airport configuration, and the economic benefits of civil use of Scott recognize the fact that Lambert is limited in capacity. To maintain St. Louis' role as a national air transportation center, additional airport system capacity is required. The forecast growth at Scott essentially fills the gap between the limited ability of Lambert to absorb either projected increases in passenger traffic or a large cargo hub operations. By providing

Table 3-3

Annual Traffic Forecast

Year	Commercial & General Aviation Operations	Passengers
1990	12,000	121,000
1991	13,421	152,200
1992	15,011	191,444
1993	16,788	240,807
1994	18,776	302,898
1995	21,000	381,000
1996	26,421	498,710
1997	33,241	652,786
1998	41,822	854,465
1999	52,618	1,118,452
2000	66,200	1,464,000
2001	73,035	1,667,916
2002	80,576	1,900,235
2003	88,896	2,164,913
2004	98,074	2,466,458
2005	108,200	2,810,000

additional capacity at Scott, to handle incremental passenger and new cargo traffic, growth potential at the other airports in the St. Louis area is not impacted.

3.3 Findings

- o To maintain or strengthen the current level of air transport activity, the St. Louis area needs additional commercial airport system capacity to take care of the growing aviation demands, and to allow more hubbing.
- o Projected traffic growth for Lambert significantly exceeds capacity.
- o Technology changes are unlikely to overcome the existing Lambert airspace and/or groundspace constraints in the forecast period.
- o Lambert cannot absorb another peak hour hub, due to capacity saturation and delays.
- o In its current and planned configuration, Lambert cannot absorb an off-peak hour, all-cargo or small package express hub because of the inadequate space, cargo facilities and environmental constraints.
- o Scott AFB, with an appropriate development program, will provide the increased airport system capacity necessary to meet future needs.

BIBLIOGRAPHY

- FAA Aviation Forecasts, St. Louis, December 1981
- Airport Activity Statistics of Certified Route Air Carriers,
USDOT/FAA/CAE 1977-1983
- FAA Aviation Forecasts, Fiscal Year 1985-1996, February 1985
- Illinois Population Trends from 1970-2025
- Sales and Marketing Management, 1985 Survey of Buying Power
- A Competitive Assessment of the U.S. Automotive Parts
Industry, U.S. Department of Commerce, March 1985
- The U.S. Motor Vehicle and Equipment Industry Since 1958, U.S.
Department of Commerce May 1985
- Origination - Destination Survey of Airline Passenger Traffic,
Domestic, Table 10 M-Z, Volume XVII-4-3 Fourth Quarter 1984.
Civil Aeronautics Board
- FAA Air Traffic Activity FY 1984
- Air Cargo Analysis Lambert - St. Louis
- International Airport, Brown and Associates, St. Louis, Missouri
and Aviation Planning Associates, Inc., Cincinnati, Ohio
- Air Cargo Statistics, U.S. Air Carriers, 1983-1984, Air
Transport Association
- Air Transport Association, 1985, The Annual Report of the U.S.
Scheduled Airline Industry. Air Transport Association, June
1985
- Ozark Airlines, System Timetable Effective October 1, 1985
- TWA Form No. T0200 effective October 27, 1985
- FAA Terminal Area Forecasts, File Data Base
- DOT-TSC 1182 Airline Hub Domestic Activity, November 1976
- TSC Large Hub Forecasts
- Airfield and Airspace Capacity/Delay Policy Analysis,
FAA-APO-31-14, December 1981
- St. Louis Metropolitan Area General Aviation System Plan, March
1985
- U.S. Census Bureau

Section 4 Airport Capacity/Demand

4.1 General

This section discusses the airfield and terminal capacity required to accommodate the potential air traffic demands discussed in Section 3.

Capacity requirements for aprons, aircraft parking stands, buildings and ground vehicle parking are staged to meet the potential occurrence of demand levels. However, the early provision of a new runway and associated taxiways is keyed to the requirement that an additional runway be provided primarily for civil operations. This is in order to preserve the integrity of the military mission.

Surface access capacity requirements are discussed in Section 8.

This section also presents meteorological data, including wind information, which is important in assessing runway utilization.

4.2 Airfield Capacity

The peak hour demand projections were compared to the existing and potential runway configurations. For capacity calculation purposes the peak, or design hour, demand is considered to be the peak hour of the average day of the peak month. Table 4-1 presents the relationship of capacity to demand for design hour and annual operations. A new parallel runway, 14L-32R has been indicated for capacity/demand calculations. Other alternatives are discussed in Section 5.

The methodology used for calculating runway capacity is outlined in the FAA Advisory Circular 150/5600-5. The hourly capacities are throughput, giving the maximum number of airport operations (arrivals, departures) that can take place on the runway component in an hour. The maximum number of operations that can occur depends on a number of conditions including:

- Ceiling and visibility
- Runway use
- Aircraft mix
- Percent arrivals
- Percent touch and go
- Exit taxiway locations
- Other operating conditions.

As demand approaches capacity, individual aircraft delay is increased. Successive hourly delays exceeding the hourly capacity result in unacceptable delays. When the hourly demand is less than the hourly capacity aircraft delays will occur if the demand within a portion of the time interval exceeds the capacity during that interval.

The annual service volume (ASV) takes into account a weighting of hourly capacities predicated on how the runways are used and the occurrence of different conditions of ceiling and visibility throughout the year. Also the demand patterns throughout the year are accounted for. Thus, the ASV for equivalent runway configurations will be significantly higher for a busy airport with steady demand patterns than for a less busy airport with substantial peaks and valleys in its demand profile.

Table 4-1 shows that hourly and annual runway capacities are substantially in excess of forecast hourly and annual aircraft operations. Theoretically, the need for the new parallel runway

AIRFIELD CAPACITY/DEMAND

<u>Year</u>	<u>Runway Configuration</u>	<u>Exit Factor</u>	<u>Mix Index</u>	<u>Peak Hour Demand</u>	<u>Hourly Capacity</u>		<u>Annual Demand</u>	<u>Annual Service Volume</u>
					<u>IFR</u>	<u>VFR</u>		
1990	One Runway 14/32	.88 .86 (IFR)	90	18	46	49	52,500	110,000
1995	Two Parallel Runways 14R/L, 32R/L	.91 .89 (IFR)	96	22	94	100	61,500	220,000
2000	Two Parallel Runways 14R/L, 32R/L	.91 .89 (IFR)	102	30	93	100	106,700	315,000
2005	Two Parallel Runways 14R/L, 32R/L	.91 .89 (IFR)	105	40	93	100	148,700	340,000

TABLE 4-1

14L/32R would not occur until after the year 2005. However, the preservation of the integrity of the military mission requires the early construction of a new runway for civil operations, thus resulting in a capacity surplus. By dedicating the new civil runway to civil operations, the capacity of the civil runway, alone, would be sufficient to accommodate the civil demand beyond the year 2005. See Table 4-2.

CAPACITY/DEMAND - CIVIL RUNWAY

<u>Year</u>	<u>Exit Factor</u>	<u>Mix Index</u>	<u>Peak Hour Demand</u>	<u>Hourly Capacity</u>	
				<u>IFR</u>	<u>VFR</u>
1995	.94 .92 (IFR)	117	22	48	51
2000	.94 .92 (IFR)	111	30	48	53
2005	.94 .92 (IFR)	112	40	48	53

Table 4-2

Should demand forecasts be exceeded by actual demand, there could be a requirement for some civil use of the military runway after the year 2005. This civil use of the military runway would be required primarily in the evening hours when the package express/cargo traffic peaks, thus presenting minimal conflict with the military traffic. Also, it should be noted that the peak hour demand of 40 operations in 2005 consists totally of departures. Should package express arrivals exceed about 30 on the civil runway, then there could be a requirement to use the military runway. This "arrival limited capacity threshold" is not expected to occur before the year 2005. Military traffic, particularly training operations, are conducted mainly during daylight hours.

It can be concluded that the parallel runway configuration will provide ample capacity to handle potential air traffic demand well beyond the year 2010, with minimal impact on military air operations. See Fig. 4-1.

4.3 Terminal Capacity

Civil terminal area capacity requirements were projected for the various functional areas and are presented in Table 4-3.

The sizing of facilities is in accordance with Federal Aviation Administration airport design standards and terminal planning references. Additionally, the consultants experience in other relevant airport planning activities was applied.

For scheduled air carrier gate requirements, the B727 aircraft (Equivalent Aircraft Factor = 1.0) was used as a proxy. Thus, the aircraft parking stand totals may vary with the application of aircraft with different parking envelope requirements.

Terminal capacity potential is projected beyond the 20 year planning horizon (1985-2005) for air carrier operations, primarily to focus on the long term potential of Scott to accommodate this demand.

4.4 Meteorological Conditions

The meteorological factors which are most influential in the investigation of airfield configuration alternatives and requirements are surface winds, ceiling/visibility and temperature. Surface wind velocity and direction influences the selection of runway directions. Visibility and ceiling affect runway operational capacity and airport service reliability. Temperature affects aircraft runway length requirements.

AIRFIELD CAPACITY-DEMAND (Hourly, IFR)

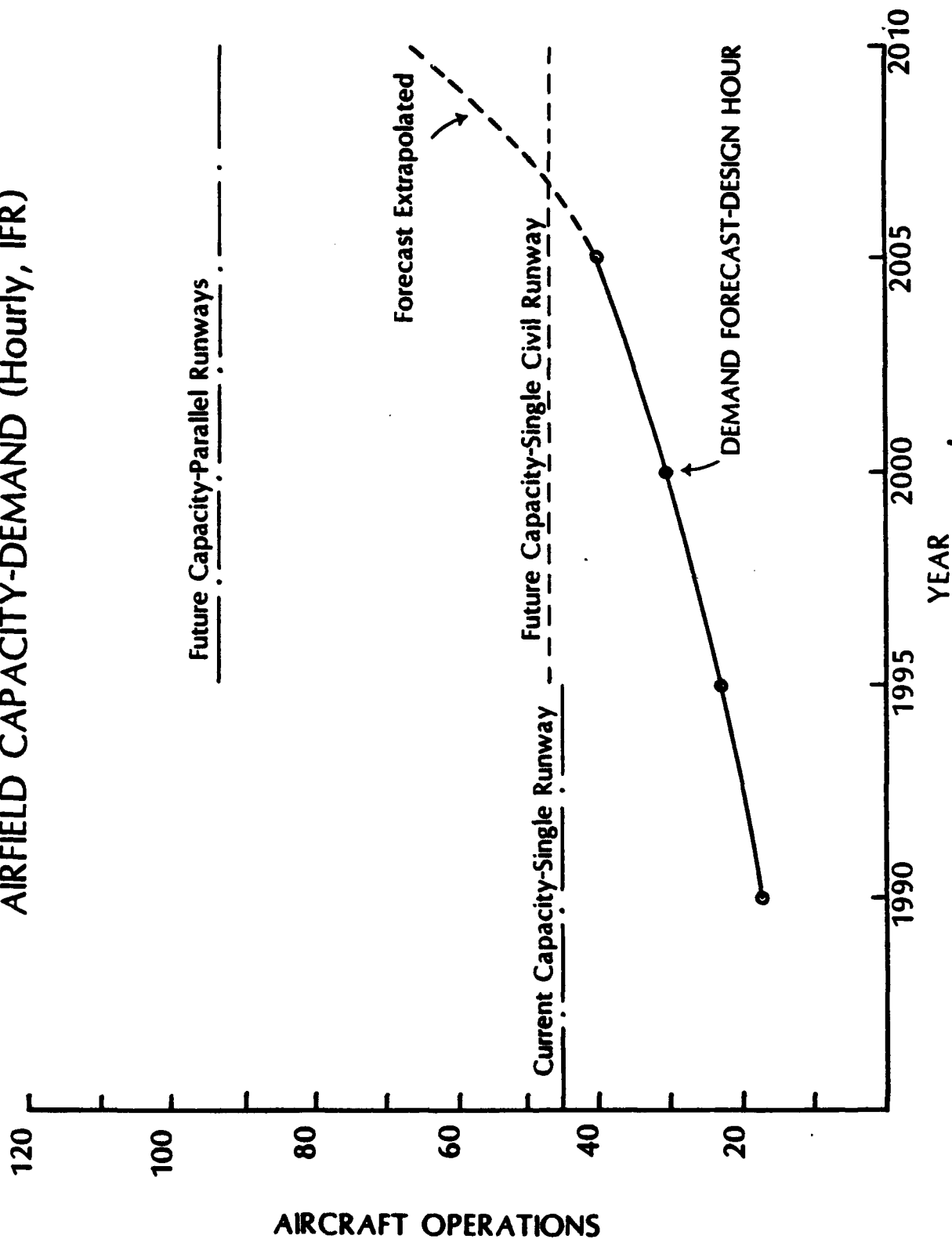


Figure 4-1

CIVIL TERMINAL AREA CAPACITY REQUIREMENTS (CUMULATIVE)*

TERMINAL AREA	Y E A R S			
	1990	1995	2000	2010+
<u>Air Carrier, Comuter</u>				
Terminal Buildings (Ft ²)	10,000	90,000	170,000	270,000
Parking Stands	5	13	21	29
Apron (Yd ²)	25,000	115,000	215,000	295,000
Auto Parking Area (Yd ²)	9,000	62,000	100,000	140,000
				300,000

Air Cargo, Express Cargo

Cargo Buildings (Ft ²)	165,000	250,000	430,000
Apron (Yd ²)	130,000	235,000	405,000
Auto, Truck Parking Area (Yd ²)	30,000	50,000	95,000

General Aviation

Buildings (Admin, FBO) (Ft ²) Hangars	5,000	25,000
Apron (Yd ²)	9,000	17,000
Auto Parking Area (Ft ²) (Spaces)	2,800 (70)	

* Requirements are for the 5 year period following the indicated year. Air carrier/comuter requirements in the year 2005 are for 2005-2010, beyond the 20 year planning horizon.

TABLE 4-3

The meteorological information used in this study is contained in the 1981 Revised Uniform Summary of Surface Weather Observations, produced by the United States Air Force Environmental Technical Applications Center (USAFETAC) Scott AFB.

4.41 Wind Data

Based on surface wind observations, wind roses were constructed for all weather winds and IFR winds. These annual wind roses, using observations covering the ten year period 1971-1981 are shown as Figures 4-2 and 4-3.

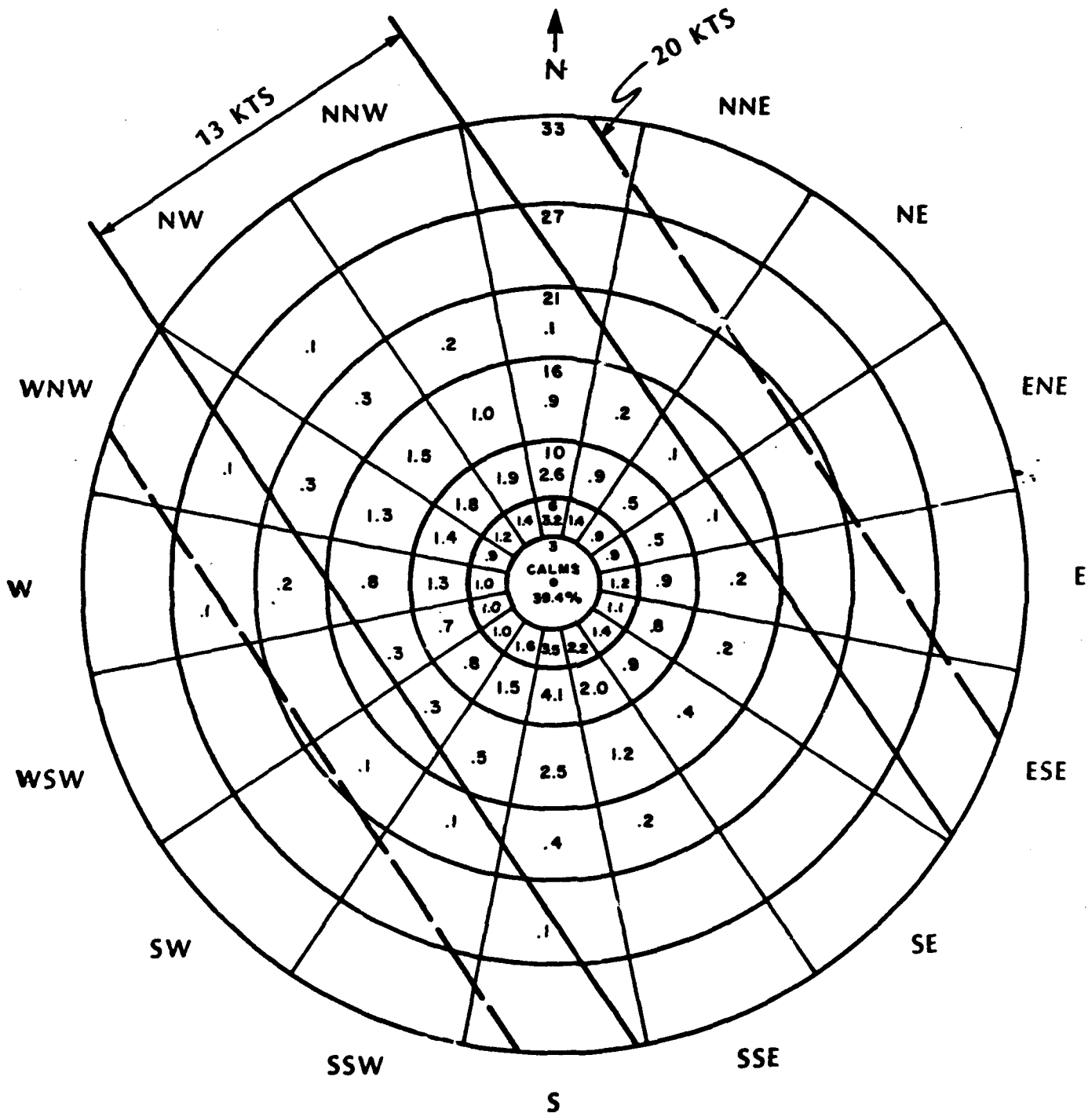
The data show that the runway 14/32 direction gives all weather coverage of 98.9% with a 13 knot crosswind component and about 100% with 20 knots. For IFR winds, the 14/32 alignment gives equivalent coverage. (IFR winds are considered as those occurring when ceiling is 200 ft. to 1400 ft. with visibility equal to or greater than one-half mile and/or ceiling equal to or greater than 200 ft. with visability one half to two and one-half miles.)

Runways are aligned so as to permit operations into the wind and minimize crosswinds. The policy of the FAA is that "Under ideal conditions aircraft takeoffs and landings should be conducted into the wind. However, other conditions, such as delay and capacity problems, runway length, available approach aids, noise abatement and other factors may require aircraft operations to be conducted on runways not directly aligned into the wind".

The criteria for operations "not directly aligned into the wind" are that the crosswind component cannot usually be greater than 20 knots and the tailwind component cannot be greater than 5 knots for turbojet aircraft weighing more than 12,500 pounds. for smaller aircraft, the corresponding normal criteria are 13 knots and 3 knots. "Calm" winds, which are 3 knots or less, are

SCOTT AFB

ANNUAL WIND ROSE SURFACE WINDS



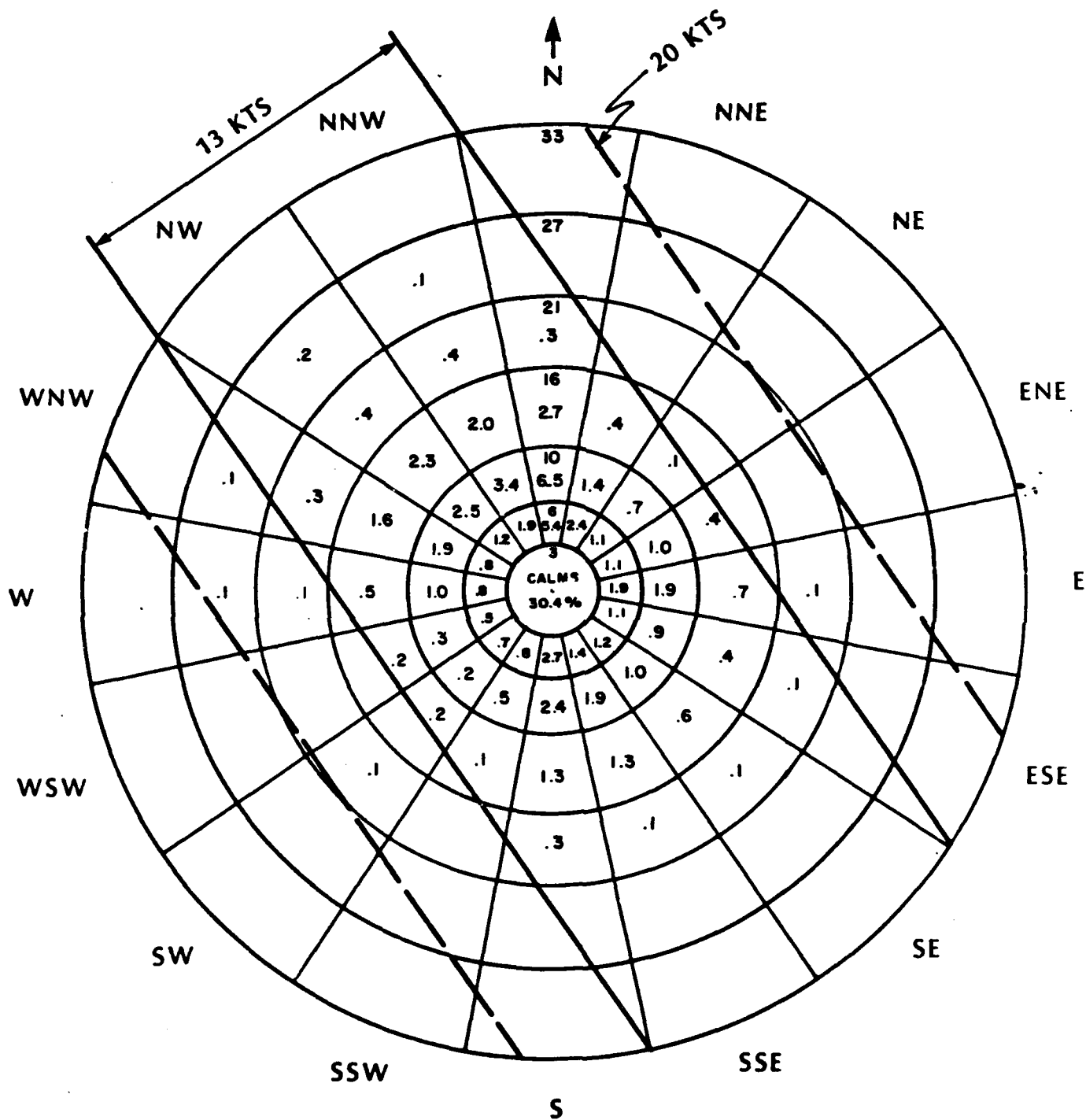
ALL WEATHER, 1971-1981, USAFETAC

Runway	% Coverage (13 KTS Crosswind)	% Coverage (20 KTS Crosswind)
14/32	98.9	100

Figure 4-2

SCOTT AFB

ANNUAL WIND ROSE SURFACE WINDS



IFR, 1971-1981, USAFETAC

Ceiling 200-1400', vis $\geq \frac{1}{2}M$ and/or Ceiling $\geq 200'$, vis $\frac{1}{2}M-2\frac{1}{2}M$

Runway	% Coverage (13 KTS Crosswind)	% Coverage (20 KTS Crosswind)
14/32	98.7	100

Figure 4-3

considered to be no wind.

It is clear that the 14/32 direction of the existing and proposed new parallel runway provide excellent wind coverage and that additional runways for crosswind operations are not required.

4.42 Ceiling and Visibility

The capacity of a runway configuration will vary in accordance with a number of factors, one of the most important of which is weather. The presence of instrument meteorological conditions (IMC) requires the application of strict aircraft separation standards by air traffic control during landing and takeoff operations. Thus the values of hourly capacity during IMC will be less than those during visual meteorological conditions (VMC).

At Scott, ceilings below 1500 ft. (MSL) and visibility less than 3 miles occur 15.4% of the time. This "IFR" weather is of sufficient magnitude to warrant selecting IFR capacity values as the design hour criterion for comparison with hourly demand.

4.43 Temperature

In calculating aircraft runway length requirements, the mean maximum temperature of the hottest month is a planning criterion. At Scott, the mean maximum temperature of the hottest month (July) is 88.5 degrees F.

Section 5 Facility Requirements

5.1 General

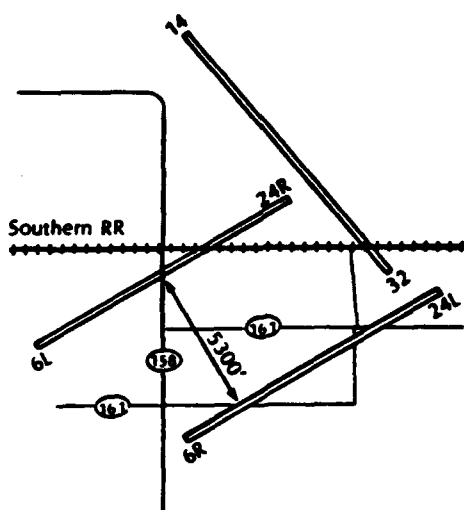
Facility requirements associated with the long term development of Scott AFB for joint use are driven by the following basic considerations:

1. Forecasts of potential civil and military demand.
2. The preservation of the complete integrity of the Air Force mission.
3. The enhancement of Air Force runway/taxiway capabilities.
4. Keeping potential adverse environmental impacts to a minimum.
5. Minimizing potential air traffic and airspace use conflicts.
6. Minimizing development and land acquisition costs.
7. Time phasing of development consistent with potential demand occurrence and availability of financial resources.

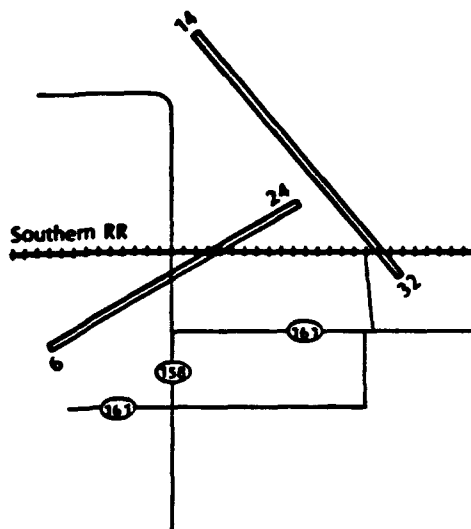
During the investigation of how facilities could be provided in keeping with these basic considerations, alternative development concepts were reviewed. See Figure 5-1. The alternatives consisted of:

1. A pair of parallel runways in a 6/24 direction to the south and integrated with the existing runway.

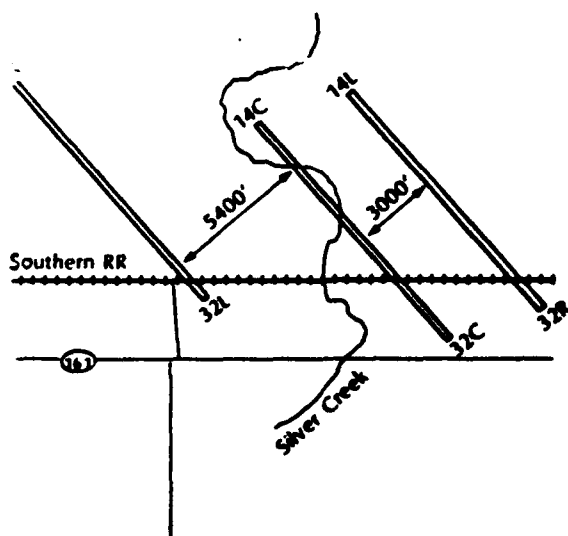
SCOTT DEVELOPMENT ALTERNATIVES



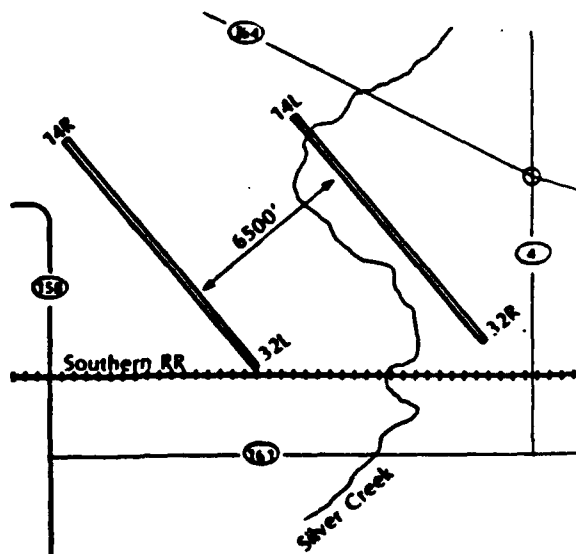
Alternative 1



Alternative 2



Alternative 3



Alternative 4

Note: Railroads and Routes 158/161 would be relocated for Alternatives 1/2/3.

Figure 5-1

2. A single runway in the 6/24 direction (the northern parallel of alternative 1) with a new parallel added should it be justified by future demand.
3. A set of parallel runways east of and parallel to the existing runway with "staggering" to the southeast.
4. A single runway parallel to and 6500 ft. from the existing runway.

Other theoretical alternatives that would place additional airfield and terminal facilities west of, or north of, the present SCOTT complex were screened out immediately due to obvious environmental, cost, or technical problems. The current base plan for Scott serves a basis for reviewing alternatives. See Fig 5-2.

Among the most critical physical features of the Scott vicinity, which impact the alternatives review, are the Silver Creek and its associated wetlands and flood plain, to the east; the Southern rail line to the south; highways I-64 and 158 to the north and west, respectively, and the roadway system to the south.

5.2 Alternatives Review

The four alternatives were reviewed in light of the seven basic considerations outlined in par 5.1. A narrative of this review is presented in Table 5-1. Based on the review, subjective ratings were developed and presented in Table 5-2.

For purposes of the review each of the basic considerations were considered of equal importance. It should be emphasized that several of the basic considerations are critical, regardless of their subjective rating, insofar as the ultimate feasibility of the project is concerned. For example, an alternative must be acceptable to the Air Force, irrespective of how it rates on its

LEGEND

BOUNDARIES

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- EXISTING PROPERTY LINE
- EXISTING FENCE
- EXISTING FENCE

- APPROACH TO NATURAL FINE
- ROAD CLEARANCES

AMFIELD ELEMENTS

- EXISTING TO BE REMOVED
- EXISTING TO BE REMOVED
- EXISTING TO BE REMOVED
- EXISTING TO BE REMOVED
- EXISTING TO BE REMOVED

STRUCTURES

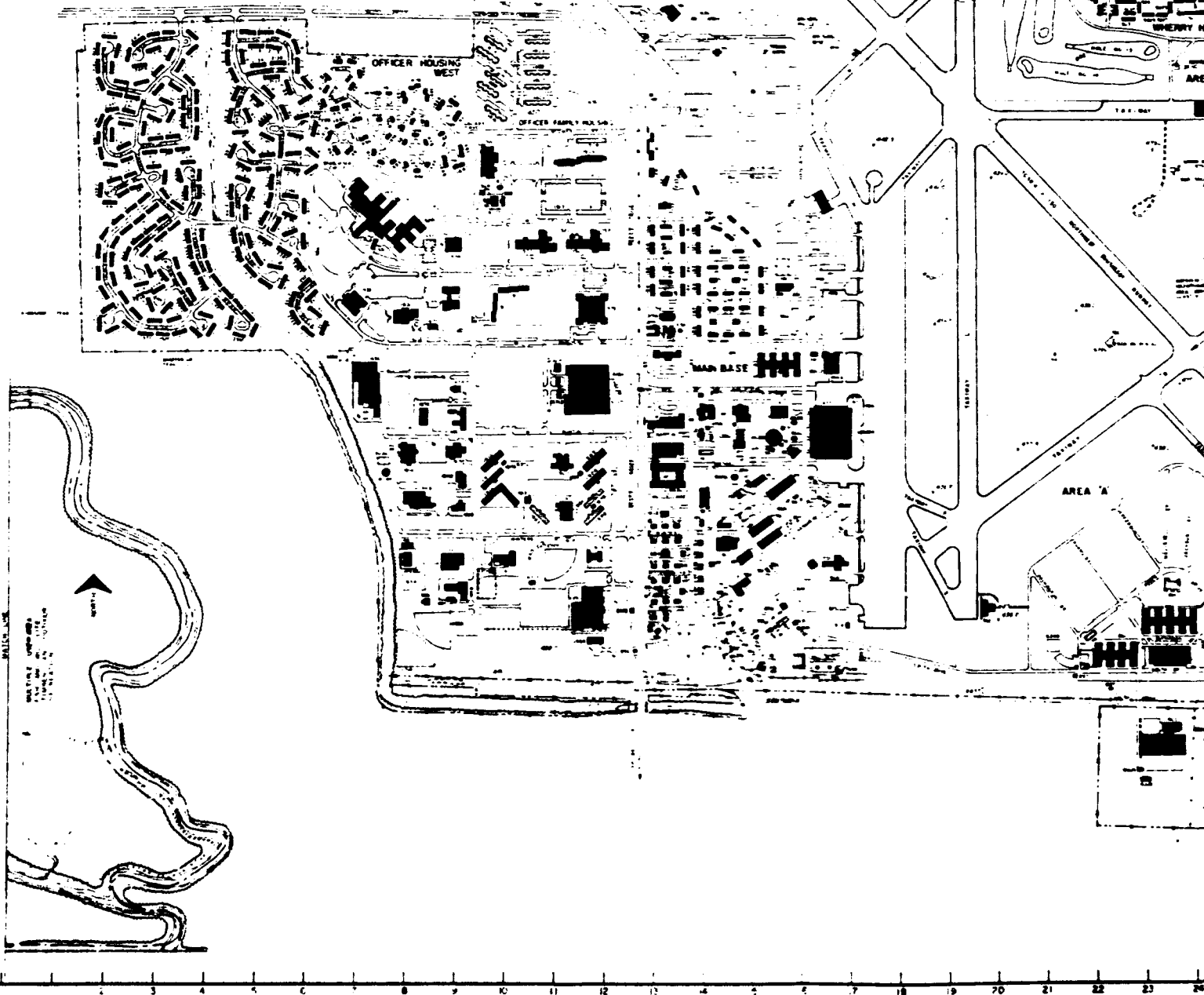
- EXISTING PERMANENT
- EXISTING SEMI-PERMANENT
- RELOCATING
- EXISTING TO BE ABANDONED / DEMOLISHED
- PROPOSED

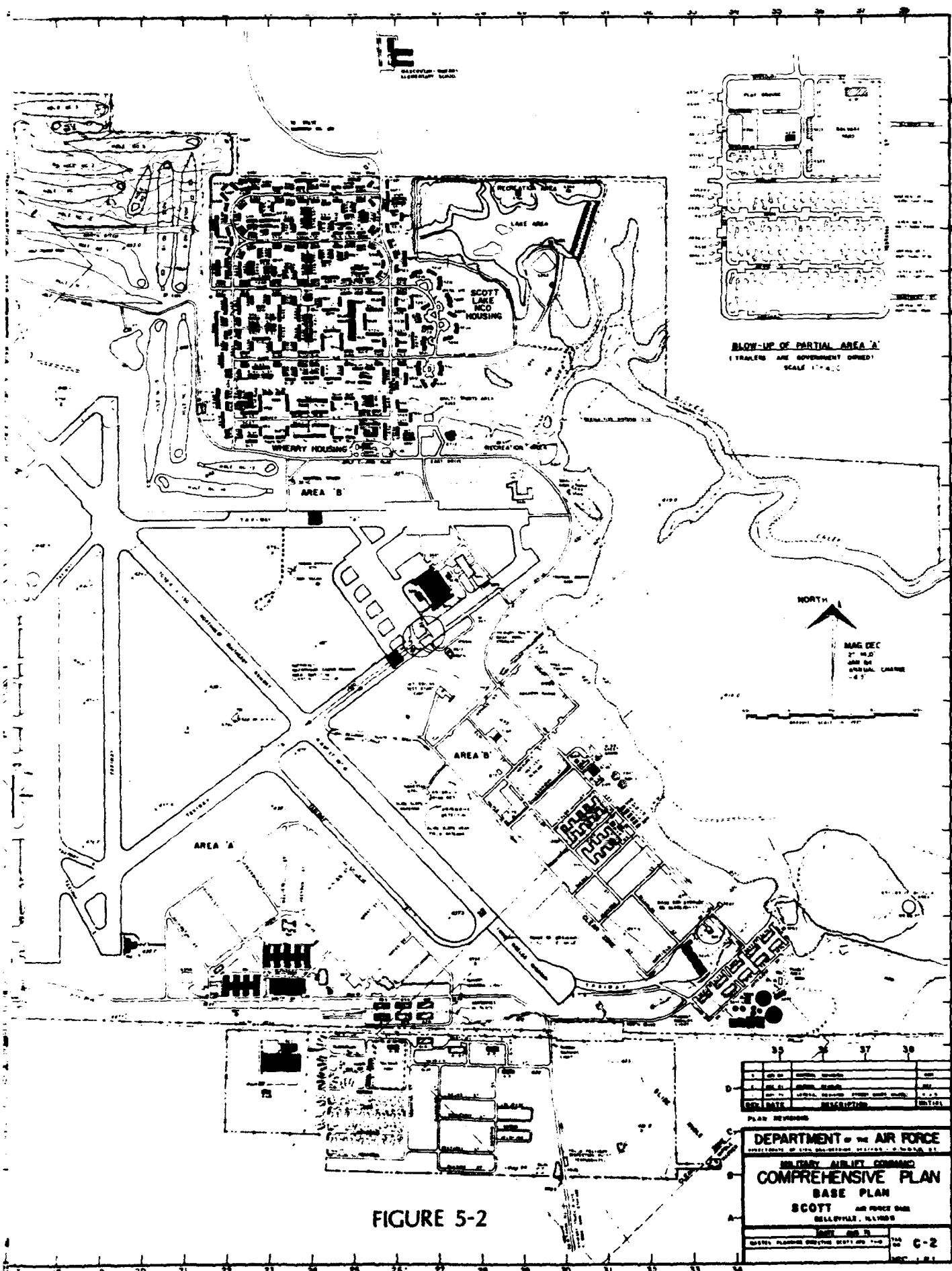
ROADS, PARKING & S.R.S.

- EXISTING TO BE REMOVED
- EXISTING TO BE REMOVED
- PROPOSED ONLY
- PROPOSED PARKING ARE
- EXISTING PARKING

NATURAL FEATURES

- WATER
- EXISTING TREE LOW
- EXISTING TREE LOW





ALTERNATIVE DEVELOPMENT CONCEPTS

	1. Parallel runways 6/24, to south and intersecting runway 14/32	2. Single Runway 6/24	3. A pair of new parallel runways 14L/32R, 14C/32C	4. A single new parallel runway 14L/32R at 6500 ft from 14R/32L with threshold stagger
Meet Demand Forecast	Will adequately accommodate demand beyond 2010. This assumes that military runway will become a crosswind runway and most traffic will operate from parallel runways.	Due to intersecting runway centerlines (6/24 and 14/32), IFR capacity reduced to slightly better than single runway capacity, but will accommodate demand through year 2005.	Adequate capacity to meet long term requirements. The requirement for a third 10,000' parallel runway for long term requirements may not be necessary.	Adequate capacity to meet long term requirements.
Preserve Military Mission	There will be a requirement to substantially integrate the military and civil operations because the military runway will essentially be a crosswind runway.	Same as 1. The 6/24 runway direction does not give 95% wind coverage in IFR conditions, thus the requirement that runway 14/32 be used by civil operations.	The dedication of the 2 new runways to civil use preserves the integrity of the military mission.	The dedication of the new runway to civil uses preserves the long term integrity of the military mission. After the year 2005, there may be a requirement for minimal use of the military runway by civil traffic during the late evening hours. Initially there will be some use of the military runway by civil traffic, until the new runway is built.
Enhance AF Runway and Taxiway Capabilities	Military runway and taxiway capabilities will be enhanced by providing a parallel taxiway and rehabilitating the runway, including lighting. However, when military traffic must use the new runways, taxiing will be substantial for departures on 6 and landings on 24.	Same as 1. When military traffic required to use 6/24 (wind would require operations towards runway centerline intersection), substantial taxiing required by military traffic for departures on 6 and landings on 24.	Military runway and taxiway capabilities will be enhanced by the provision of a parallel taxiway and runway rehabilitation, including lighting.	Same as alternative 3.
Minimize Environmental Impacts	There will be no additional noise impacts on built-up areas. There will be substantial prime farmland removed from production (4,700 acres). Community disruptions will be substantial due to the closing of existing roads and people relocation.	Same as 1., except short term land acquisition would be less, theoretically. In order to protect long term land availability, it may be prudent to acquire full 4,700 acres early.	There will be no additional noise impacts on built-up areas, with the exception of the military Wherry housing. This housing would be exposed to additional high noise levels (75 Ldn) as will two schools which may need relocation. The location of runway 14C/32C at 5400' from 14R/32L would require substantial wetlands mitigation measures. The solution to the wetlands impact would be problematic. Archaeological investigations would be required. Prime farmland acquisition is estimated at 2000 acres.	There will be no additional noise impact on built-up areas, with the exception of the Wherry housing, which will be exposed to 65-70 Ldn levels, generally the same as current exposure at the west side of this from the existing runway operations. Wetland mitigation measures will be necessary as will creek crossing structures and earthwork to preclude flooding. The location of the runway at 6500 ft. from 14R/32L rather than 5400' as in alternative 3, should result in an implementable plan. Prime farmland acquisition is estimated at 1000 acres. However it is possible that much of the prime farmland can continue its farm use. Archaeological investigation will be necessary.

ALTERNATIVE DEVELOPMENT CONCEPTS

	1. Parallel runways 6/24, to south and intersecting runway 14/32	2. Single Runway 6/24	3. A pair of new parallel runways 14L/32R, 14C/32C	4. A single new parallel runway 14L/32R at 6500 ft. from 14R/32L, with threshold stagger
Minimize Airspace Conflicts	Runways are not aligned parallel to Lambert and Downtown Airports, therefore airspace operational conflicts will result. FAA has indicated that 6/24 alignment may not be feasible.	Same as alternative 1.	The parallel runway alignment imposes the least airspace conflicts with Lambert and Downtown Airports, although impacts will be substantial, as with all runway alignments. This is due to the additions of runways and traffic in the system. FAA has indicated feasibility with this runway alignment.	Same as alternative 3.
Minimize Costs	Total cost (1990-2010) of \$405M includes cost of relocating 7 miles of railroad, 5-6 miles of roads and acquiring 4700 acres of land. Also cost includes the construction of 2 new runways and associated taxiways. Apron and terminal sizing are equivalent to Alternative 4.	Total cost (1990-2010) is same as 1 for long term requirements. Costs to 2005 would be \$310M.	Total cost for the 20 year plan period would be 20% higher than alternative 4 (\$430M total) because of the need to relocate the Southern Railroad and local roads, the cost of the third runway and the extensive wetlands investigation measures with attendant creek crossing structures or creek channelization, realignment.	Costs for the 20 year planning period are \$360M. The location of the runway does not require railroad or road relocations and minimizes prime farmland acquisition.
Effective Time Phasing	Up-front development intensive and immediate costs high. Time phasing to accommodate air demand build up is not practical.	Same as 1, except costs are lower and time phasing better.	Up-front development and costs are high due to the need to relocate the railroad and roads and immediate runway construction prior to civil cargo introduction.	Up-front development and costs are relatively low and keyed to the gradual build up of civil traffic. Railroad and road relocation are not necessary at the outset and civil facilities will be initiated adjacent to the existing runway which will be used by civil traffic until the new runway is built.

TABLE 5-1 (cont'd)

RATING OF ALTERNATIVES

<u>Alternative</u>	<u>Meet Demand Forecasts</u>	<u>Preserve Military Mission</u>	<u>Enhance Military Runway/Taxi</u>	<u>Minimize Environmental Impacts</u>	<u>Minimize Airspace Conflicts</u>	<u>Minimize Costs</u>	<u>Effective Time Phasing</u>	<u>Composite Rating</u>
1. (2 new parallel runways 6/24)	Excellent	Fair	Good	Fair	Poor	Fair	Poor	Fair
2. (single new runway 6/24)	Good	Fair	Good	Fair	Poor	Good	Fair	Fair to Good
3. (2 new parallel runways 14/32)	Excellent	Excellent	Excellent	Poor	Good	Poor	Poor	Fair
4. (single new parallel runway 14/32)	Excellent	Excellent	Excellent	Fair	Good	Good	Good	Good to Excellent

TABLE 5-2

preservation of the military mission. If an alternative results in a runway configuration considered not feasible by the FAA due to airspace conflicts, the alternative must be rejected. Of significance is the capability of a proposed plan to pass the tests of environmental acceptability.

The "do nothing" alternative has not been addressed in this feasibility study in view of the substantive economic benefits that would flow to southwestern Illinois with the civil development of Scott and the potential it affords to provide additional civil airport capacity for the St. Louis region. The "do nothing" alternative must be addressed in an environmental impact assessment should there be a decision to proceed with civil development.

5.3 Alternative Selection

Alternative 4 was chosen as a result of its favorable performance when measured against the basic considerations discussed previously and presented in Tables 5-1 and 5-2. Alternative 2, which is a less elaborate version of alternative 1, ranked second. Of course, alternative 2 would be expandable to the larger configuration if needed.

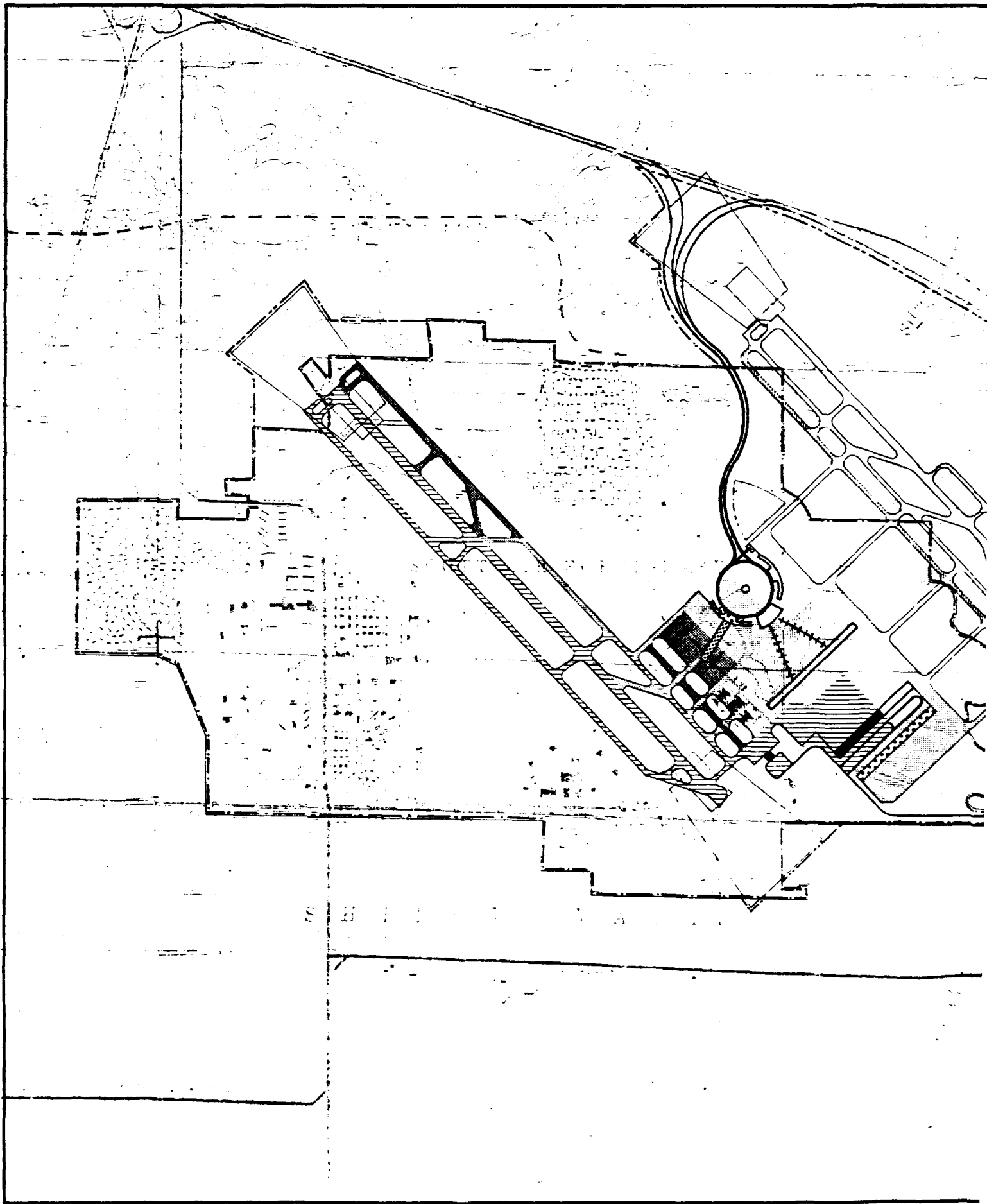
Alternative 4 is not without its drawbacks. Its principal problem is the relationship of the proposed new parallel runway to Silver Creek and its wetlands/floodplain. The runway has been purposely located east of the creek, 6500 ft. from the present runway in order to minimize impacts. A closer location, say 5000 to 5500 ft. would be better from a taxiing standpoint, but could have major impacts on the creek and its wetlands. The earthwork necessary to avoid flooding, the creek crossing structures for the runway and taxiways, and associated mitigation measures are costly, but technically feasible. On balance it is believed that

minimizing the natural environmental impacts is preferred to engendering the human impacts associated with alternatives 1 and 2 which require the acquisition of up to 4700 acres of prime farmland, the relocation of roads and the railroad. Up to 23 individual farms would be acquired under alternatives 1 and 2, compared to 4 under alternative 3.

The principal drawbacks to alternatives 1 and 2 are technical, in that potential airspace conflicts are substantial due to the runway alignment. Also the physical relationship of the military runway and the proposed 6/24 runway(s) requires an integration of military and civil traffic. While the up-front costs of alternatives 1 and 2 are high and time phasing is not ideal, alternatives 1 and 2 cannot be rejected out of hand, unless found unacceptable from an airspace standpoint by the FAA. The significant environmental impacts of alternatives 1 and 2 result from the human impacts due to the displacement of people through acquisition of prime farmland and the community disruption from the relocation of Routes 161 and 158 and other local roads. In addition to the direct impacts to individual farmers, tenants and local farm productivity there will be secondary effects on the agricultural support services economy of the area.

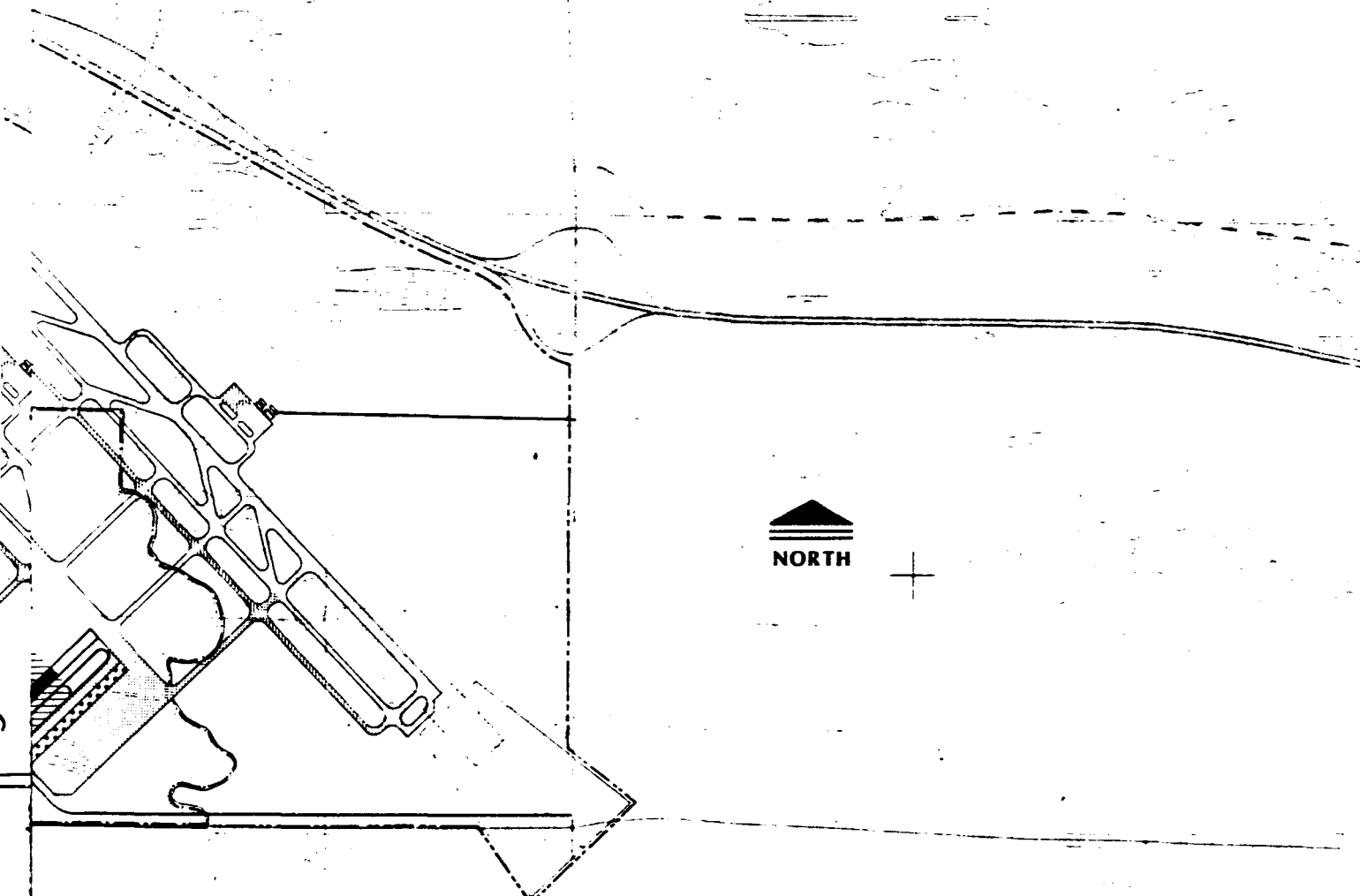
5.4 Airfield Requirements

Section 4 discusses runway capacity requirements, noting that the staging of an additional runway is timed not for capacity alone, but because the early development of a new runway is required in order to preserve the integrity of the military mission. Thus, the new runway proposed in the selected alternative is timed to be in operation by 1995. See Fig 5-3, Airport Development Concept.



ILLINOIS DEPARTMENT OF TRANSPORTATION
**FEASIBILITY STUDY FOR JOINT USE
 CIVIL/MILITARY AIRPORT**
 SCOTT AIR FORCE BASE BELLEVILLE, ILLINOIS
 IPAC, INC. - TAMS

(DWG TITLE) AIRPORT DEVELOPMENT CONCEPT	
AS SHOWN SCALE	JRG/PLS DESIGNED BY
LFU DRAWN BY	RWP APPROVED
4/14/88 DATE	FIGURE 8-3 DWG. NO.



LEGEND

BUILDING	PAVEMENT	STAGE	EXISTING PROPERTY LINE
		STAGE 1 - 1990	PROPERTY REQUIRED FOR DEVELOPMENT
		STAGE 2 - 1995	TERMINAL SUBWAY
		STAGE 3 - 2000	RUNWAY
		STAGE 4 - 2005	TAXIWAY
		STAGE 5 (2010+)	PROPOSED ACCESS ROAD
			AIR TRAFFIC CONTROL TOWER
			CRASH FIRE RESCUE

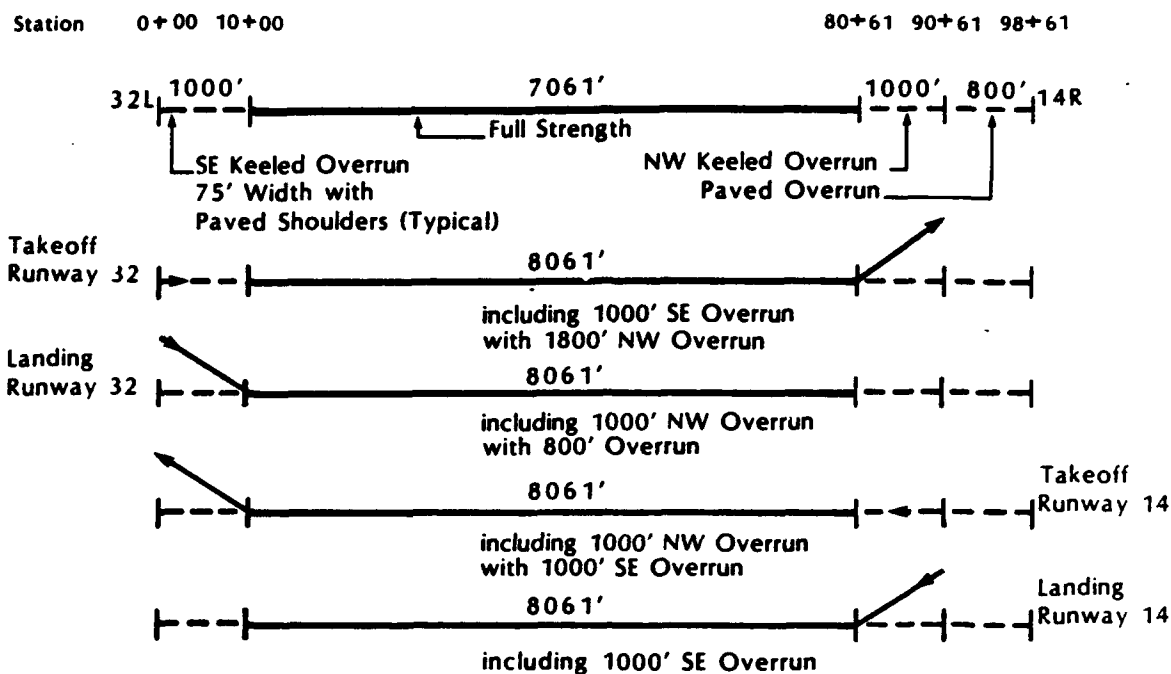
SCALE IN FEET
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A runway length of 10,000 ft. was chosen as being needed to accommodate the most demanding aircraft that might be expected after 1995. The 10,000 ft. length will accommodate a B747 - 200 at maximum takeoff and landing weights at a mean maximum daily temperature of 88.5 degrees. All new runway, taxiway and apron pavements are to be designed to accommodate the design aircraft which has been determined to be the B727-200 operating at a maximum takeoff weight of 209,500 pounds (dual wheel).

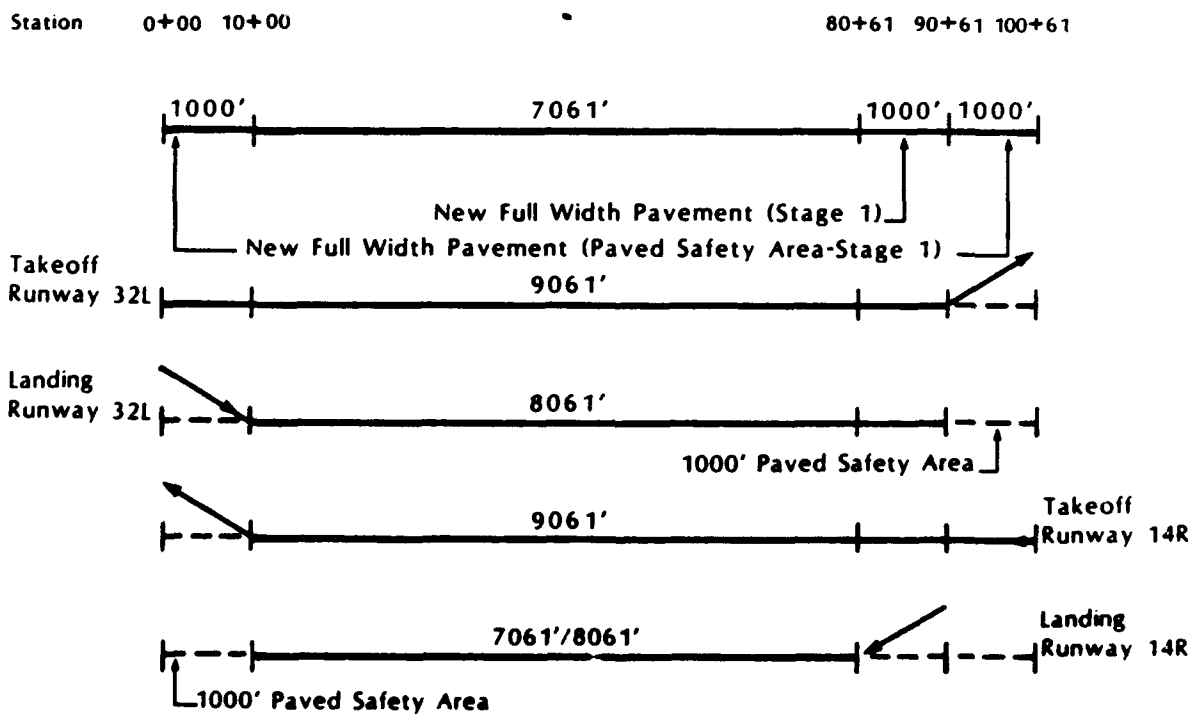
There is a potential requirement to strengthen the existing runway pavement to accommodate interim use by civil aircraft, particularly B727 type. A review by the State's Division of Aeronautics is currently underway and a final determination will be made after coordination with the Air Force. An important consideration will be an assessment of the appropriate design and the potential runway down time.

Costs of pavement strengthening have not been included in this report but could be as much as \$2,000,000 for an interim use 8" bituminous concrete overlay. Long term civil use would require reconstruction of the runway for an additional \$6,000,000. However, such long term civil use is not contemplated.

In the staged, near term development plan, the existing runway 14R/32L will be upgraded. The upgrading proposed consists of the construction of full strength and width sections of 1000 ft. at the south end and 2000 ft. at the north end. These areas are presently beyond the runway thresholds and are keeled/paved overruns. The resultant runway will provide 9061 ft. for takeoff in both directions and 7061 to 8061 ft. landing. See Figure 5-4. The runway length will be sufficient to accommodate a B747-200F with an anticipated haul length of 1750 miles loaded to within 90 percent of its maximum structural payload.



Existing Operational Configuration (U.S. Air Force)



Proposed Operational Configuration (Joint Use)

Figure 5-4

The Stage 1 plan also calls for the construction of a full strength and width taxiway parallel to and west of the existing runway to expedite the movement of military traffic and civil traffic. Connecting and short parallel taxiways are proposed east of the runway to expedite the flow of civil traffic to and from the new civil air carrier and cargo facilities while the existing runway is used for civil operations. A full parallel taxiway and high speed exit taxiways on the east side of the existing runway are not contemplated until after the year 2000 (phases 3 and 4) and their need then will depend on the extent of use of the runway by civil traffic.

Landing and lighting aids will be installed on the new runway to provide Category II capability. This will include edge, touchdown and centerline lights, approach lights with sequence flashers (ALSF-2) and precision approach path indicators (PAPI's) at both runway ends. Microwave landing systems (MLS) are proposed for each runway end. Taxiway edge and centerline lighting are proposed, as well as standard apron lighting systems.

The proposed plan tentatively includes an ALSF-2 for existing runway 14. Whether an ALSF-2 should be installed will be predicated on the capability of reducing runway 14 landing minima from its present 300 ft. ceiling and one mile visibility to say, 200 ft. ceiling and 1/2 mile visibility. The current landing minima are controlled by obstructions to the northwest, primarily trees and farm structures. It is conceivable that extending the full strength runway 2000 ft. to the northwest could result in landing minima reduction by placing the existing structures outside the instrument approach flight path. This would also affect the location of the ALSF-2 relative to the landing threshold. Further investigation by the Air Force, applying Terminal Instrument Procedures (TERPS), is necessary.

5.5 Terminal Requirements

Civil terminal requirements will be met in stages in line with the overall development concept. Table 4-3 presents civil terminal area capacity requirement for airline, air cargo and general aviation buildings, parking stands, aprons and auto/truck parking. The Airport Development Concept, Fig 5-3, shows the location, dimensions and staging of airfield and terminal facilities.

5.51 First Stage (1990)

In addition to the runway/taxiway upgrading discussed in 5.4, the first stage development plan calls for a 350' x 600' apron to serve 4 to 8 scheduled carrier and commuter design hour operations. The linear arrangement of parking stands would face a functional terminal building of about 11,250 sq. ft., served by a parking area for approximately 200 autos. Secured access would be via state route 4, from the east side of Scott. Approximately 1.8 miles of 2 lane road with two small bridges would be constructed, including a roadway fronting the terminal.

The access road would also serve the first stage cargo area, which is proposed to serve all cargo and package express operations. The 1,100 ft. x 900 ft. apron fronting a 165,000 sq. ft. cargo building will accommodate 20 to 25 aircraft depending on specific type. In addition, a contiguous 400 ft. x 400 ft. apron will provide 3 to 5 cargo aircraft depending upon size. (Package express operations are sized for Falcon and B727 type; all-cargo sized for class D, or heavier.) Parking for autos and trucks amounts to 29,100 sq. yds. including a 2,200 ft. internal roadway system accessing air cargo buildings and parking areas. The first stage would also see the development of fire/crash and rescue facilities and facilities for housing snow removal and maintenance

equipment. These would supplement the Air Force capability, which would be utilized until Stage 2. See Figure 5-5.

5.52 Second Stage (1995)

In addition to the new runway discussed in 5.4, this stage adds a new air carrier passenger terminal and apron with hydrant fueling, auto parking, and a ground access link to I-64. This terminal development is keyed to handle forecast demand occurring in the 1995-2000 time frame and hopefully would be in place in 1995 or shortly thereafter. Eight parking positions for B727 sized aircraft are projected for the 91,100 sq. yd. of apron area.

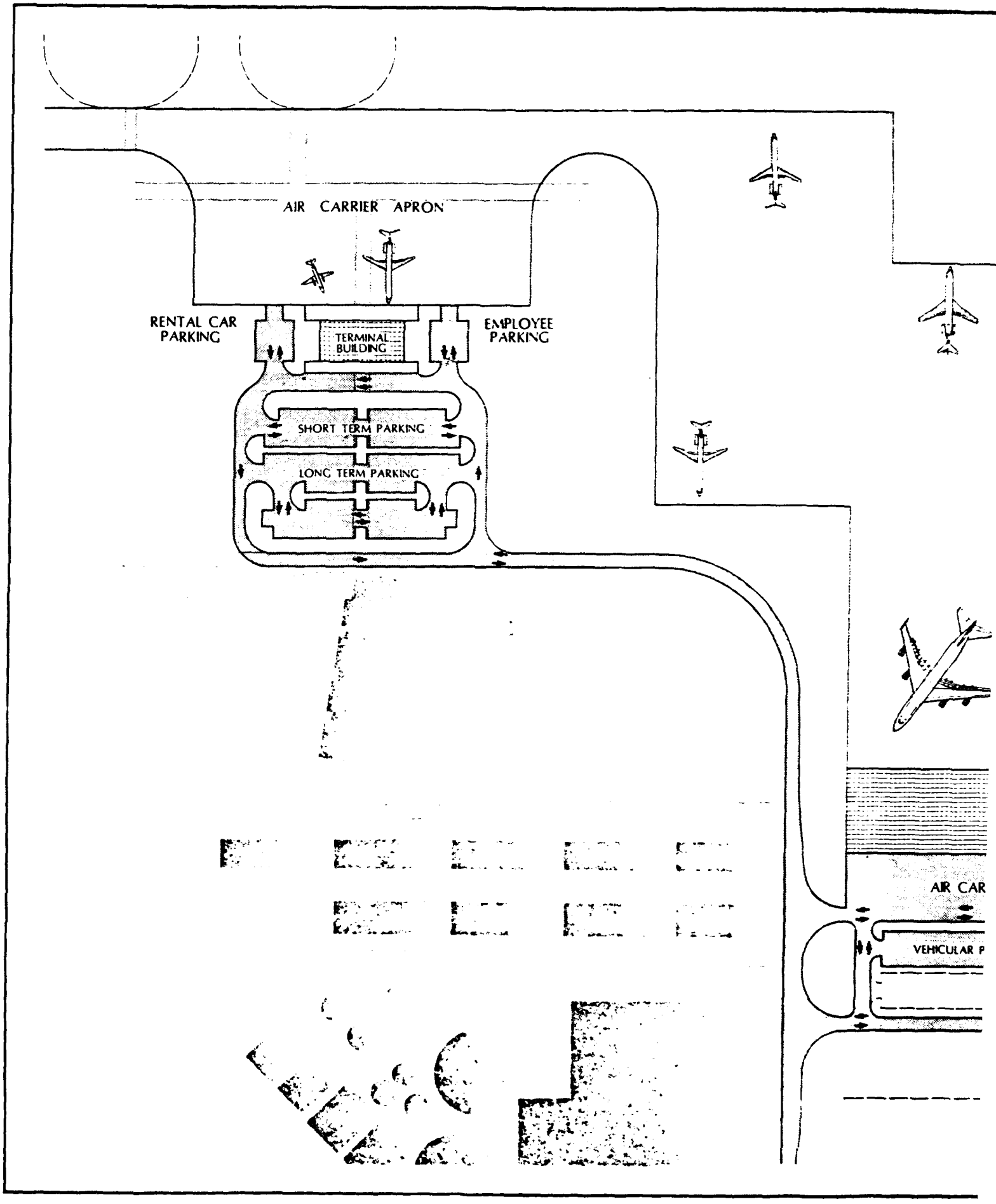
Assuming continued growth of air cargo operations, an extension of the cargo area is proposed. This includes adding about 107,000 sq. yds of apron and 70,000 sq. ft. of cargo building space with 18,500 sq. yds of additional auto/truck parking and roadway extensions.

This stage calls for relocation of the Air Traffic Control Tower for optimum visibility to landing areas, with minimum building shadowing. A likely candidate site would be the center of the auto parking area inside the terminal access roadway. A new tower of 80 to 100 ft. in height should suffice.

A small general aviation terminal area, with appropriate taxiways, is proposed east of the new runway. It is anticipated that this will serve primarily transient corporate/business aircraft. Access to the general aviation facilities will be via a 2 lane road east to route 4.

5.53 Third Stage (2000)

This stage continues the expansion of terminal facilities for scheduled air carrier, cargo and general aviation. Added is a



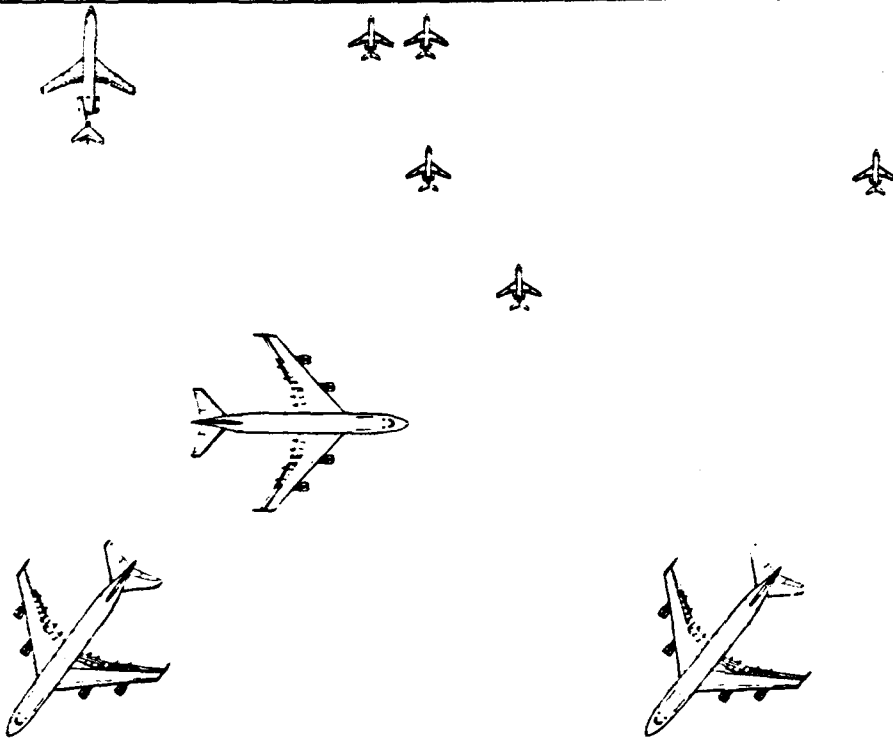
ILLINOIS DEPARTMENT OF TRANSPORTATION
**FEASIBILITY STUDY FOR JOINT USE
 CIVIL/MILITARY AIRPORT**
 SCOTT AIR FORCE BASE BELLEVILLE, ILLINOIS
 IPAC, INC. - TAMS

(DWG. TITLE) **TERMINAL CONCEPT - FIRST STAGE**

AS SHOWN	PLS/JRG	LFU	RWP	4/14/86	FIGURE S-5
SCALE	DESIGNED BY	DRAWN BY	APPROVED	DATE	DWG. NO.



SCALE IN FEET
 100 0 100 200 300



AIR CARGO APRON

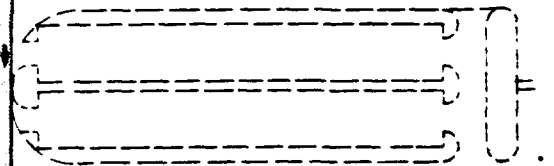
AIR CARGO BUILDING

AIR CARGO TRACTOR-TRAILER LOADING AND OPERATING AREA

VEHICULAR PARKING

TRUCK
PARKING

VEHICULAR PARKING



passenger terminal building of 80,000 sq. ft. with about 111,100 sq. yds. of apron for 8 additional aircraft parking positions. A cargo complex southeast of the stage 1 and 2 complex is proposed. The additional apron amounts to 169,500 sq. yds. with a building of 180,000 sq. ft. and parking for autos/trucks of 47,000 sq. yds. While this addition has been included totally in this stage it could conceivably be phased between this and the fourth stage, depending on how the cargo activity develops. The fourth stage might consist of the southwestern portion of the complex.

This stage will eliminate access to two administrative buildings 3189 and 3190 totaling 95,000 sq. ft. These buildings are scheduled for removal in the Base Comprehensive Plan.

An expansion of the general aviation apron is contemplated for this stage.

5.54 Fourth Stage (2005)

This stage, to accommodate traffic projected for 2005-2010, beyond the 20 year planning horizon, expands the processing area of the third stage terminal and adds a pier and apron on the west side adequate to accommodate about 8 more gates. A 2500 ft. bypass parallel taxiway is added as is an extension of the parallel taxiway east of 14R/32L. The requirement for this extension will be predicated on whether there will be civil use of 14R/32L.

The location of the Stage 4 terminal facility on the west side and not nearer the civil runway is due to the need to avoid, insofar as possible, construction in the wetlands. Thus there is a tradeoff between wetlands impact mitigation and taxiing distances.

5.55 Fifth Stage (2010+)

This stage, which is also beyond the 20 year planning horizon, shows terminal expansion potential based on an extrapolation of forecast activity. The remote aircraft parking unit is connected to the passenger processing/terminal unit by an underground people mover. There is ample area sufficient to accommodate on the order of 35 additional gates. Additional taxiway construction consists primarily of a bypass parallel to 14L/32R. Additional auto parking may be positioned east of the entrance road and/or multilaned parking facilities constructed over the stages 1-4 parking facilities.

Section 6 Schedule of Development and Capital Costs

6.1 Schedule of Development

The schedule of development shown in Table 6-1 is generally keyed to the occurrence of aviation demand projected as described in Section 3. The development schedule is keyed to fixed periods in time. However, in order to minimize cost impacts of inaccurate forecasts, implementation of the schedule should be related to demand thresholds, or events. Also, it should be emphasized that development schedules based on the occurrence of demand thresholds must be reviewed prior to implementation to assure that projected activity levels are reasonably on target.

If investments are made too early because of an overly optimistic forecast of growth in aviation activity, premature capital costs and unnecessary operating expenses can be incurred and more efficient uses of the investment capital can be lost. If investments are made too late because of an underestimation of aviation growth, lost revenues and inconvenience can be substantial.

The schedule includes the potential development after the year 2005, beyond the 20 year planning horizon. This potential development is feasible should it be required by demand growth.

6.2 Capital Costs

The capital costs included in the development schedule and summarized in Table 6-2 are planning estimates only, and should be treated as such. They are based on 1985/86 costs for similar development items for other U.S. airport projects. Expressed in 1986 constant dollars, they are not escalated for inflation.

**SCHEDULE OF DEVELOPMENT
BY STAGE AND COST
1986 CONSTANT DOLLARS**

<u>Recommended Development</u>	<u>Year</u>	<u>Capital Cost</u>
<u>Stage 1 (1990)</u>		
Land Acquisition (1500 acres, includes total development)	1988	3,550,000
Earthwork, drainage	1989	6,900,000
Initial wetlands mitigation measures	1988	150,000
Paving (3000'-rwy. 14/32; taxiways; aprons; shoulder rehab.)	1990	23,550,000
Buildings (passenger terminal, cargo)	1989	13,550,000
Lighting (HI, rwy. 14/32, taxiways, aprons)	1990	1,600,000
Approach aids	1990	1,100,000
Access Roads (south), including bridges	1988	2,050,000
Miscellaneous (utilities, parking lots, landscaping, security)	1988	2,600,000
SUBTOTAL, STAGE 1		55,050,000
Contingencies (20%)		11,000,000
Architectural/Engineering, Construction Management		7,950,000
Total, All Items, Stage 1		74,000,000

TABLE 6-1

<u>Recommended Development</u>	<u>Start Year</u>	<u>Capital Cost</u>
<u>Stage 2 (1995)</u>		
Earthwork, drainage	1991	14,750,000
Creek crossing structures, water management, wetland mitigation measures	1991	18,350,000
Paving (new runway 14L/32R, taxiways, aprons, g.a. facilities)	1993	36,650,000
Buildings (passenger terminal, cargo bldg., CFR/snow removal general aviation)	1993	21,400,000
Landing Aids, lighting (CAT 2 lighting, PAPIS, ALSF, MLS-both ends, 14L/32R; taxiway, apron lighting); relocate ATCT	1994	7,100,000
Access Roadway (north), including bridges	1992	4,300,000
Miscellaneous (utilities, parking, landscaping, security, hydrant fueling)	1992	7,400,000
SUBTOTAL, STAGE 2		109,950,000
Contingencies (20%)		22,000,000
Architectural/Engineering, Construction Management		15,850,000
Total, All Items, Stage 2		147,800,000
Total, All Items, Stages 1-2		221,800,000

TABLE 6-1 (cont'd)

<u>Recommended Development</u>	<u>Start Year</u>	<u>Capital Cost</u>
<u>Stage 3 (2000)</u>		
Earthwork, drainage	1996	2,900,000
Creek crossing structures, water management, wetlands mitigation sedimentation control, creek channelization	1996	2,600,000
Paving (aprons, taxiways)	1988	19,750,000
Buildings (passenger terminal, cargo bldg., CFR/snow removal, general aviation)	1988	32,850,000
Lighting (taxiways, aprons)	1999	300,000
Miscellaneous (utilities, parking, landscaping, hydrant fueling)	1997	5,300,000
SUBTOTAL, STAGE 3		63,700,000
Contingencies (20%)		
Architectural/Engineering, Construction Management		12,750,000
		9,150,000
Total, All Items, Stage 3		85,600,000
Total, All Items, Stages 1-3		307,400,000

TABLE 6-1 (cont'd)

<u>Recommended Development</u>		<u>Start Year.</u>	<u>Capital Cost</u>
<u>Stage 4 (2005)</u>			
Earthwork, drainage		2001	1,150,000
Sedimentation control, wetlands mitigation		2001	100,000
Paving (apron, taxiways)		2003	9,000,000
Buildings (passenger terminal, CFR/snow removal)		2003	13,100,000
Lighting (taxiways, apron)		2004	100,000
Miscellaneous (utilities, parking structure, landscaping, hydrant fueling)		2002	13,800,000
	SUBTOTAL, STAGE 4		37,250,000
Contingencies (20%)			7,450,000
Architectural/Engineering, Construction Management			5,350,000
Total, All Items, Stage 4			50,050,000
Total, All Items, Stages 1-4			357,450,000

<u>Recommended Development</u>	<u>Start Year</u>	<u>Capital Cost</u>
<u>Stage 5 (2010+)</u>		
Earthwork	N.A.	
Creek crossings (bypass taxiway), sedimentation control, wetlands mitigation		5,100,000
Paving (taxiway, aprons)		2,650,000
Buildings (passenger terminals - incl. people mover, CFR/snow removal)		26,550,000
Lighting (taxiway, apron)		56,850,000
Miscellaneous (utilities, parking/structure, landscaping, hydrant fueling)		400,000
		12,000,000
		103,550,000
SUBTOTAL, STAGE 5		
Contingencies (20%)		
Architectural/Engineering, Construction Management		20,700,000
		14,900,000
Total, All Items, Stage 5		139,150,000
Grand Total, All Items, Stages 1-5		496,600,000

TABLE 6-1 (cont'd)

DEVELOPMENT COST ESTIMATES SUMMARY

(MILLIONS) (1986 CONSTANT DOLLARS)

DEVELOPMENT ITEM	STAGE 1 1990	STAGE 2 1995	STAGE 3 2000	STAGE 4 2005	STAGE 5 2010+
• Land	3.55				
• Earthwork, Drainage	6.90	14.75	2.90	1.15	5.10
• Creek Crossings Wetlands Mitigation	0.15	18.35	2.60	0.10	2.65
• Paving	23.55	36.65	19.75	9.00	26.55
• Buildings	13.55	21.40	32.85	13.10	56.85
• Landing Aids, Lighting ATCT Relocation	1.60	7.10	0.30	0.10	0.40
• Access	1.10	4.30			
• Miscellaneous	2.60	7.40	5.30	13.80	12.00
• Subtotals	55.05	109.95	63.70	37.25	103.55
• Contingencies (20%)	11.00	22.00	12.75	7.45	20.70
• Architect/Engineering Construction Management	7.95	15.85	9.15	5.35	14.90
• Total, All Items	74.00	147.80	85.60	50.05	139.15

Table 6-2

Section 7 Airspace and Air Traffic Control

7.1 General

Scott Air Force Base is located about 27 nautical miles from Lambert Field, serving St. Louis, Mo., on a bearing of 119 degrees. The Lambert Terminal Control Area (TCA) extends to within 3 miles of Scott Air Force Base, from an altitude of 4500 feet MSL to 8000 feet MSL. Aircraft operating in the TCA must be equipped with radio to maintain contact with Lambert Approach Control, and must receive permission to enter or transit the TCA. Aircraft departing Scott on runway(s) 32 must turn north or south, and remain below 3000 feet above the airport until they are no longer under the TCA, unless they have the proper equipment and have received permission to penetrate the TCA. Commercial air carrier aircraft are properly equipped to operate in a TCA. As traffic at Scott Air Force Base increases, it may some time become desirable to incorporate the Scott Terminal Area into the TCA.

The Federal Aviation Administration has currently underway a massive program to equip the air traffic control system with new, automated equipment designed to increase the capacity of the system. The new equipment will enhance the capability to control traffic in the TCA. However, in assessing possible effects of airports capacity increases, it is better not to be too optimistic about the time and probability of favorable events. It therefore was deemed prudent to assume that aircraft arriving or departing Scott should not plan on traversing the TCA, and that the existing Scott terminal area would remain untouched. Arrival and departure routes were planned accordingly.

Airspace around Scott Field is under the control of the Scott Approach Control. Aircraft are transferred to Kansas City En

Route Control when leaving Scott Field Approach Control, and approaching aircraft are transferred from Kansas City En Route Control to Scott approach Control when they enter the Scott Field airspace. The Scott airspace extends west under the Lambert TCA from the ground to an altitude of 3000 feet, as shown in Figure 7-1. The ceiling increases to 5000 feet east of an arc centered on Lambert and passing Scott. The ceiling is increased to 6000 feet each of an arc centered on Lambert, five statute miles east of Scott.

A little more than three statute miles northwest from Scott the centerline of the existing runway passes over a portion of the village of O'Fallon. A little more than 3 miles to the southeast the village of Mascoutah is similarly situated. Currently, aircraft on approach to runway 32 are vectored so they will not pass over Mascoutah. Aircraft approaching runway 14 are similarly vectored so they will not pass over O'Fallon. Departing aircraft also turn to avoid these villages. The proposed new runway will be almost 1.25 miles northeast of the present runway, far enough that the extended centerline will miss both villages.

7.2 Current Approach and Departure Tracks

There are a total of six nonradar approaches to Scott available for fixed wing aircraft. The current approach and departure tracks are shown schematically in Figures 7-2 and 7-3. Figure 7-2 shows runway 14; Figure 7-3 shows runway 32. Also shown are the five gates to and from the Scott airspace. Clockwise, the gates handle traffic to and from the north, northeast, east, and south and west. Nonradar controlled inbound instrument traffic to Runway 14 begins at the ALBRE Initial Approach Fix (IAF) 14 nm DME inbound to the Scott TACAN on the 097 degree radial at a mandatory altitude of 3,000 feet MSL. Inbound traffic then flies a 10nm DME counterclockwise arc, maintaining

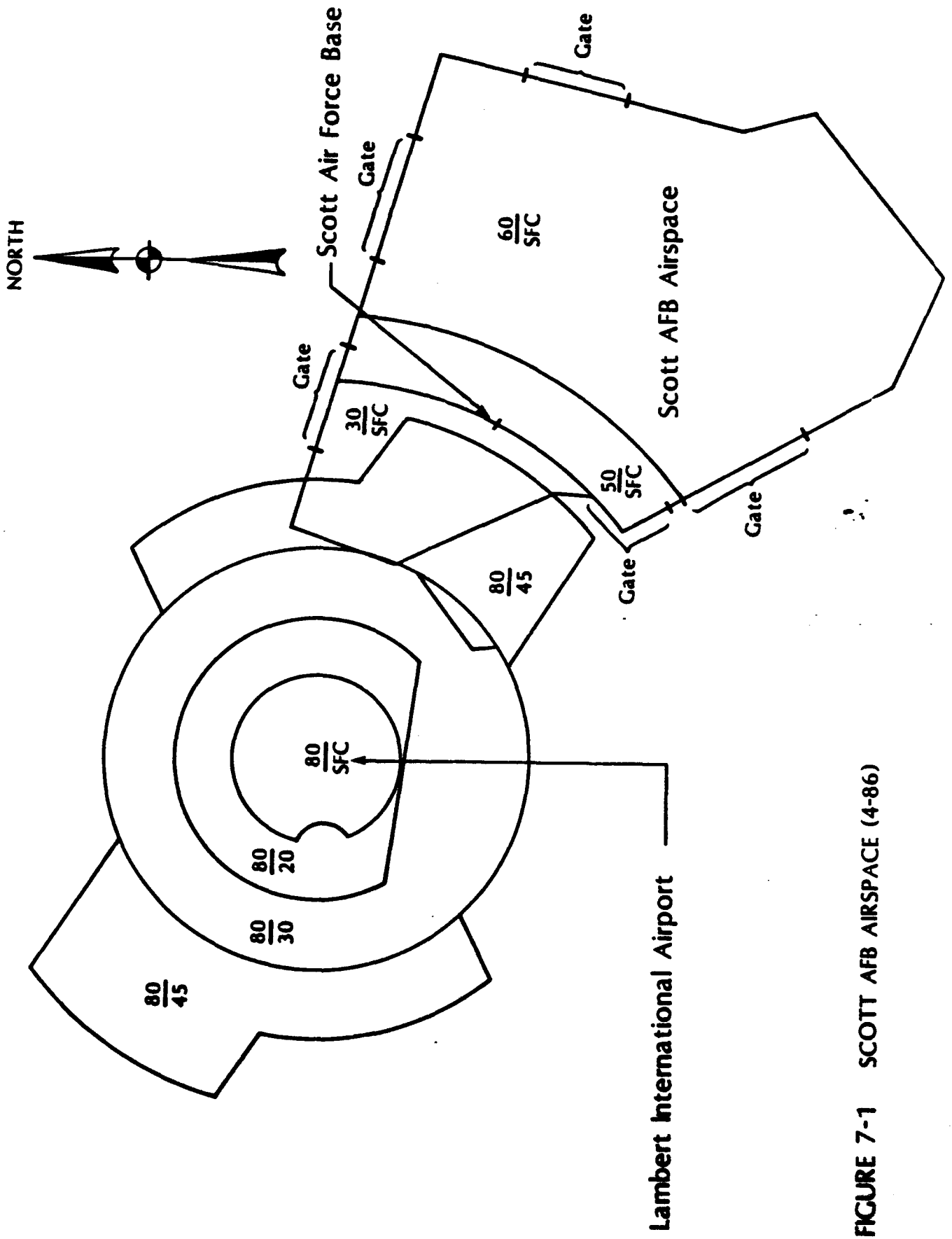


FIGURE 7-1 SCOTT AFB AIRSPACE (4-86)

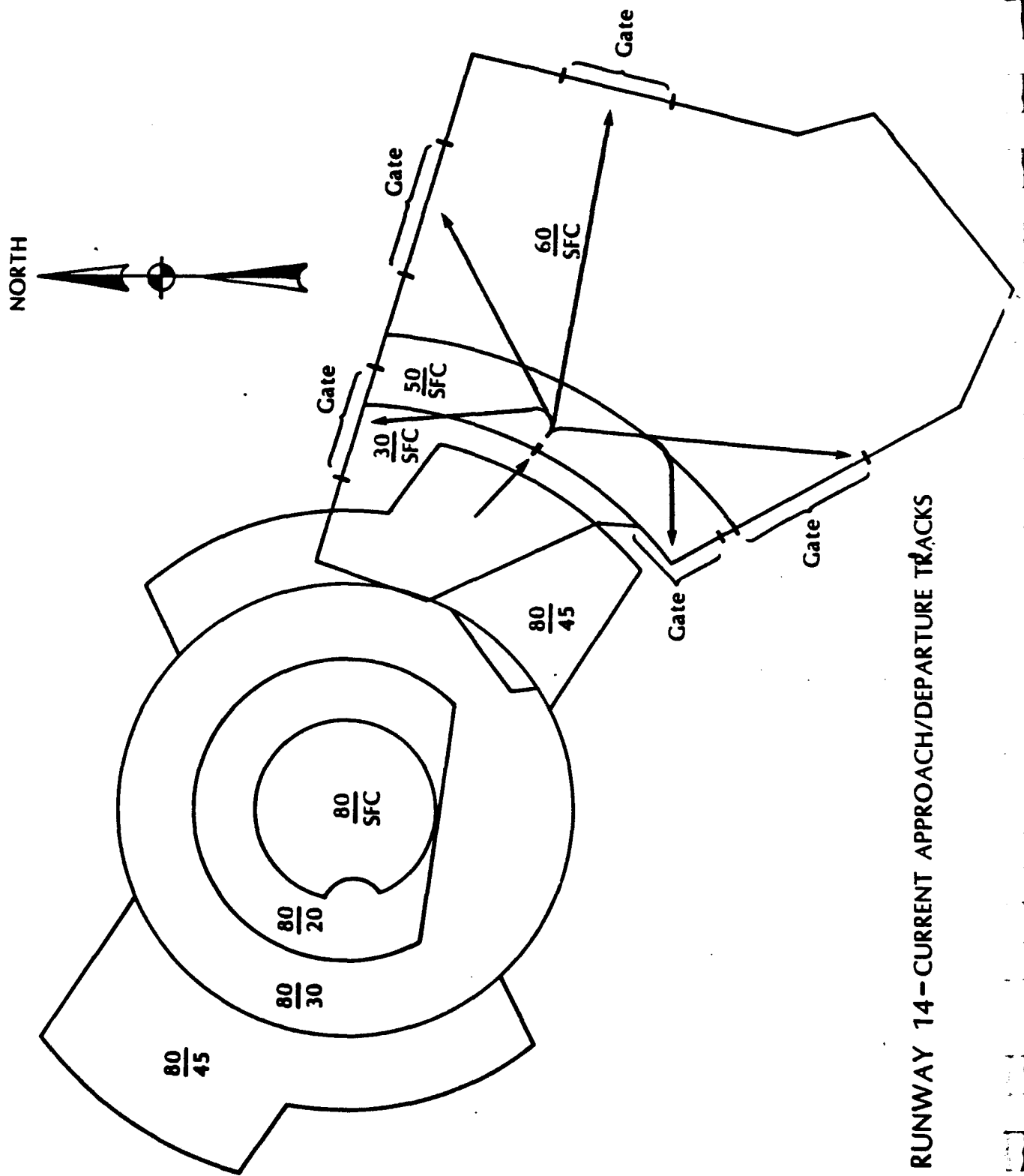


FIGURE 7-2 RUNWAY 14-CURRENT APPROACH/DEPARTURE TRACKS

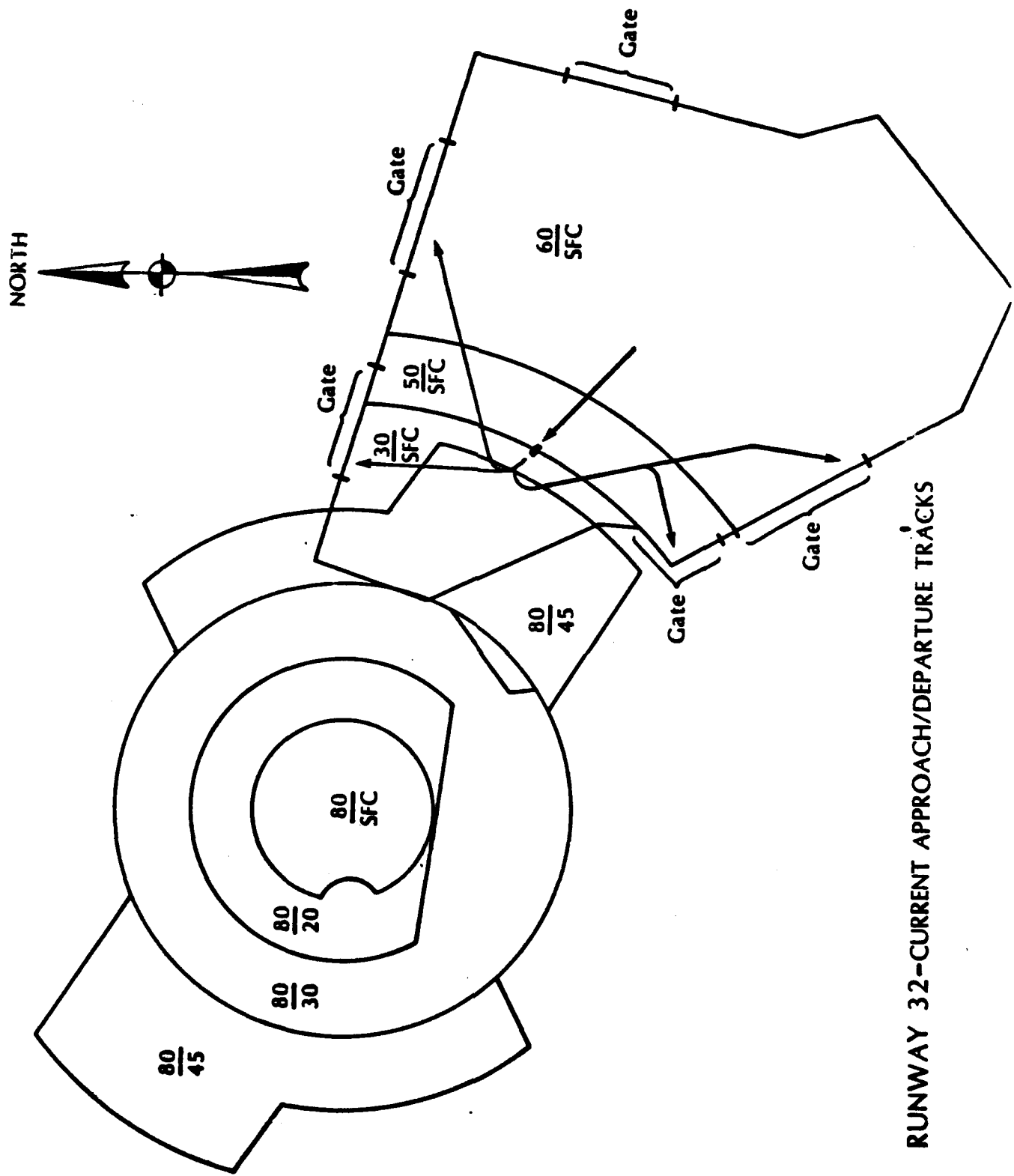


FIGURE 7-3 RUNWAY 32-CURRENT APPROACH/DEPARTURE TRACKS

3,000 feet MSL, until crossing the 350 degree radial off the Scott TACAN. At this point, instrument traffic descends to 2,000 feet MSL while turning to intercept the localizer course of 135 degrees. Approaching traffic then descends to 1,600 feet MSL inbound on the localizer until intercepting the glide slope. At this point a controlled descent (on the glide slope) is followed down to the published decision height (DH) of 703 feet at which point a decision is made to either continue with the approach on visual references or lacking visual references, execute a missed approach. Executing the missed approach is completed by making a climbing left turn, to intercept the 097 degree radial off the Scott TACAN and proceeding 14 nm DME outbound to the ALBRE IAF and holding.

Inbound nonradar controlled instrument traffic to Runway 32 may begin by proceeding outbound from the IAF, Belleville NDB (6.5 nm DME), on the localizer back course of 135 degrees followed by a procedure turn inbound, within 10 nm of the IAF, while descending to an altitude of 2,400 feet to intercept the 315 degree localizer course inbound. Approaching traffic then maintains 2,400 feet until intercepting the glide slope and proceeding on a course and on the glide slope down to the decision height and missed approach point. The missed approach is initiated by climbing to 900 feet MSL straight ahead followed by a right climbing turn to 3,000 feet MSL and proceeding direct to the NDB and holding. Aircraft without NDB equipment, making an approach to Runway 32 may begin by flying the 14 nm DME and clockwise from the ALBRE AIF at a minimum altitude of 2,000 feet MSL to intercept the inbound localizer course of 315 degrees. Approaching traffic then maintains 2,000 feet MSL until intercepting the glide slope and proceeds on course and glide slope down to the decision height and missed approach point. The missed approach is executed by first climbing straight ahead to 900 feet MSL then making a right

climbing turn to 2,000 feet MSL to intercept the 097 degree radial outbound from the Scott TACAN and proceeding direct to ALBRE and holding.

7.3 Proposed Operations

The following table shows daily traffic estimates for the year 2005.

Operations		
	Peak Hour	Daily
Total	40	407
Air Carrier	10	68
Commuter	6	11
Package Express	40	123
All Cargo	5	12
General Aviation	12	82
Military	14	111

TABLE 7-1

It is apparent that the peak hour occurs at night when a majority of the package express arrive or depart within the same hour.

This means a departure from Scott, on the average, every 90 seconds. The lowest climbout speed to 1000 feet is 140 knots. This is an initial average separation of 3.5 miles, which will increase as aircraft achieve the headings for their gates and depart the main stream. At the peak hour, maintenance of radar separations of a minimum of 3 miles will be required. Otherwise, there will be delays.

The arrival and departure tracks for runway 32R, which will

be in use 75% of the time, are as shown on Figure 7-4. All aircraft departing on runway 32R at night will start a right turn about 6000 feet from the end of the runway. Aircraft departing south or west will cross over any inbound traffic above 3000 feet. Inbound traffic on either 32R or 32L will be below 2000 feet. Traffic with insufficient climb rates will be diverted further east to gain sufficient altitude or to a point not affected by inbound traffic. Northbound traffic departing in the early morning hours when traffic at Lambert is presumably light, may be permitted to climb above 3000 feet, into the TCA. However, this is not a necessity. Most aircraft will not reach 3000 feet until they have passed the boundary of the TCA, at which time they would be entering the airspace of the Kansas City En Route facility.

It should be remembered that military traffic is light at night in normal circumstances. In the year 2005, the peak hour traffic is in-bound or outbound cargo traffic at night. Consequently, at the time of peak outbound traffic, early in the morning, there will be little or no inbound traffic. Similarly, at the time of peak inbound traffic, late in the evening, there will be little or no outbound traffic. The total traffic during the day is greater (approximately 3 times as much) than the total traffic during the night, but it is spread over more hours, uses both runways, and has a lower peak which includes both arrivals and departures.

Arrival and departure tracks for runway 14L are shown in Figure 7-5. Again, late night northbound departures may be able to transit the TCA.

These arrivals and departures tracks are not intended to be definitive. The final airspace configuration will be determined by the air traffic control authorities and will depend upon the airfield configuration chosen, the equipment available, and the

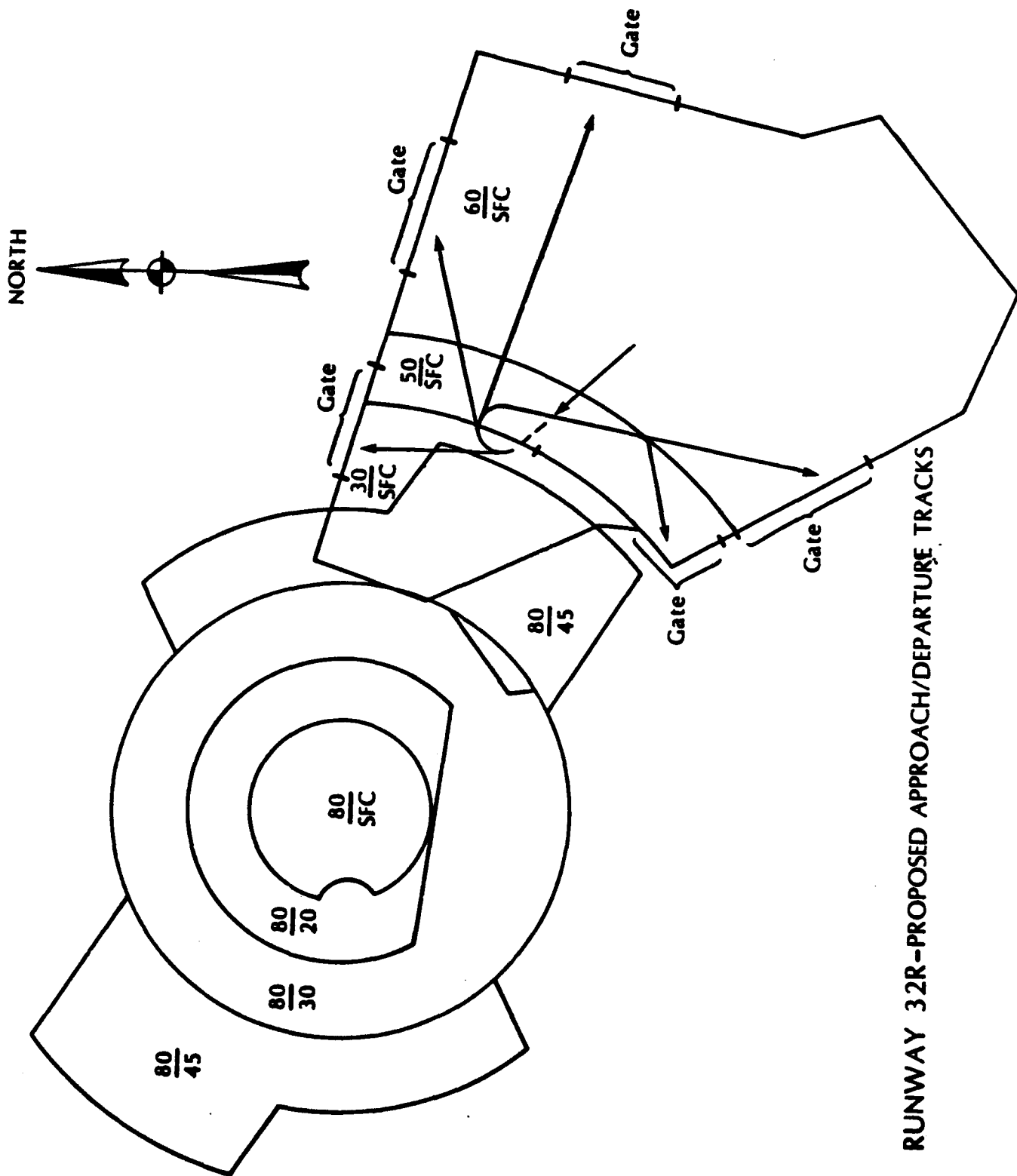


FIGURE 7-4 RUNWAY 32R-PROPOSED APPROACH/DEPARTURE TRACKS

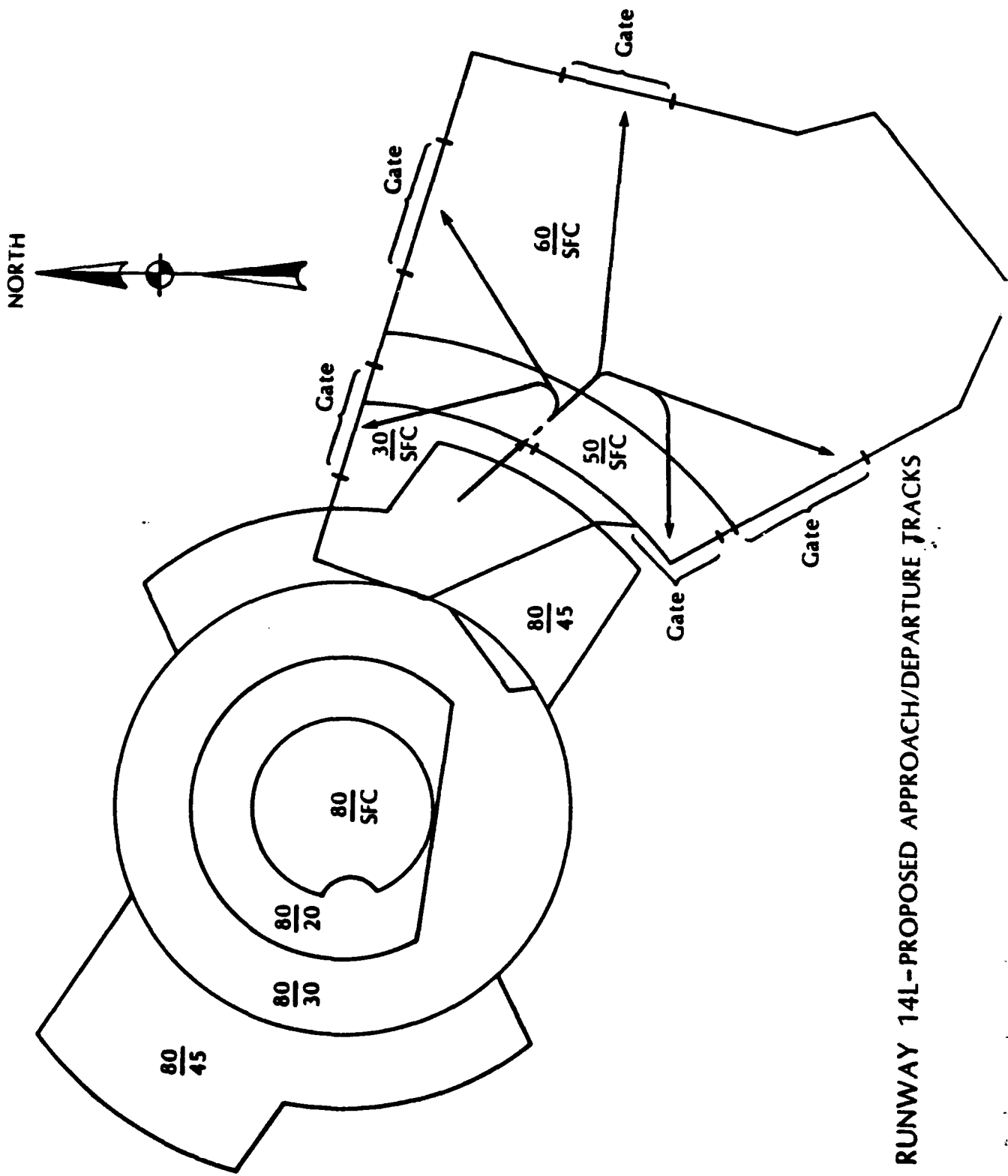


FIGURE 7-5 RUNWAY 14L-PROPOSED APPROACH/DEPARTURE TRACKS

traffic into and out of Scott and other airports nearby. In its review of alternative 3 (see Section 5) the FAA has determined that 2 new parallel runways east of 14/32 would be feasible but that substantial impacts on operations at Lambert and Downtown Airports could result if CAT I, II and III instrument operations were conducted from all six runway ends. The FAA has stated that "Given necessary resources, traffic flow compatibility, and time to design a system, operations at the three locations could be made compatible." The FAA has not reviewed the recommended alternative, which eliminates the third runway. It can be concluded that the single additional parallel runway is feasible and would likely be less problematical than alternative 3.

The material herein is intended to show a possible working arrangement for air traffic management of joint military and civil operations at Scott. The arrangement emphasizes the avoidance of flying over heavily populated areas and provides data for calculating illustrative noise contours.

7.4 Obstacle Limitation Surfaces

The safe and efficient use of an airport is influenced by natural features and man-made construction which may impact on the use of the local airspace. At Scott, farm structures, terrain and trees to the northwest affect landing minima as discussed in Section 5. To the southeast the location of the Southern Railroad fixes the location of the approach surface to the existing runway 32 and the proposed runway 32R. Figure 7-6 shows the civil obstacle limitation surfaces, in accordance with Part 77 of the Federal Aviation Regulations, for the proposed parallel runway configuration.

The military obstacle limitation surfaces, also outlined under Part 77, are somewhat different. The principal difference



NORTH

PRECISION APPROACH SURFACE (TYP)

7:1 TRANSITION SURFACE (TYP)

HORIZONTAL SURFACE

20:1 CONICAL SURFACE

SCALE BAR

1000 0 1000 2000

ILLINOIS DEPARTMENT OF TRANSPORTATION
FEASIBILITY STUDY FOR JOINT USE
CIVIL/MILITARY AIRPORT

SCOTT AIR FORCE BASE BELLEVILLE, ILLINOIS
IPAC, INC. - TAMS

(DWG TITLE) PART 77 IMAGINARY SURFACES

AS SHOWN
SCALE

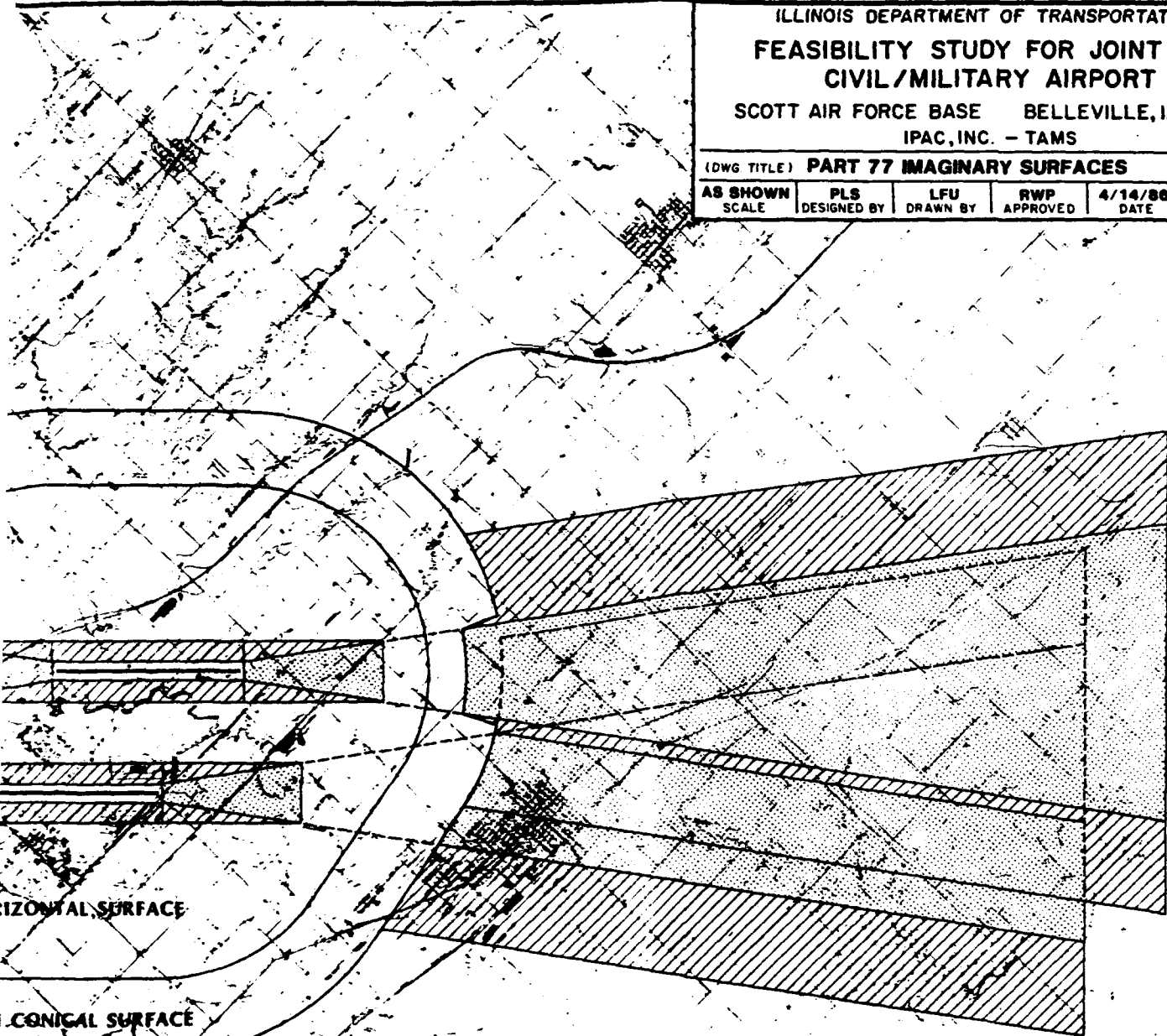
PLS
DESIGNED BY

LFU
DRAWN BY

RWP
APPROVED

4/14/86
DATE

FIGURE 7-6
DWG NO



LEGEND:

- Part 77 Imaginary Surfaces
(Controlling Obstructions)
- - - - Part 77 Imaginary Surfaces
(Not Controlling Obstructions)

Note: Existing Military Part 77 Imaginary Surfaces not depicted.

is in the size of the horizontal and conical surfaces.

There has been no attempt to integrate the civil and military requirements because doing so could further complicate an already complex presentation.

It should be pointed out that the broad purpose of these surfaces is to define the volume of airspace that should ideally be kept free from obstacles in order to minimize the dangers presented by obstacles to an aircraft either during an entirely visual approach or during the visual segment of an instrument approach. A second set of surfaces and criteria (TERPS) are used by procedure designers for the construction of instrument flight procedures and for specifying minimum safe altitude/heights for each segment of the procedure.

Section 8 Ground Access

8.1 General

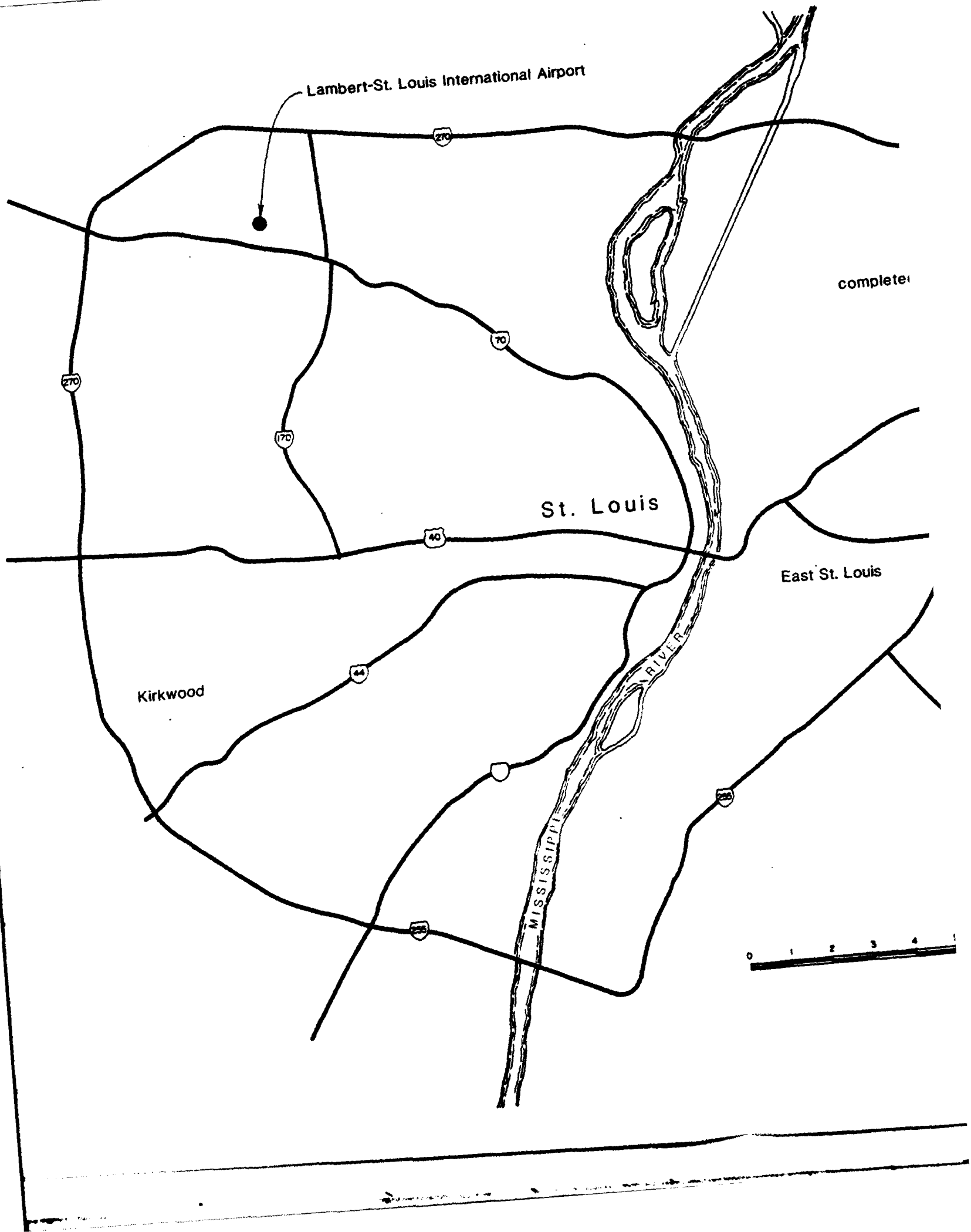
The feasibility of developing Scott AFB into a joint military/civil use facility has been investigated from a ground access standpoint. The investigation includes the following considerations:

- o Assessment of existing and proposed regional and local highways in terms of airport access needs;
- o Airport traffic generation, distribution and assignment;
- o Ability of the roadway system to absorb the added traffic in 1995 and 2005.

8.2 Existing and Proposed Transportation

8.2.1 Regional Highway Access

Located approximately 23 miles southeast of the City of St. Louis, Scott Air Force Base enjoys excellent Interstate highway access (see Figure 8-1). It is directly served by two interchanges with I-64 at Route 158 and Route 4. To the west, I-64 connects directly with I-55 and I-70 from the north. These routes merge in East St. Louis and continue west to provide a direct connection to downtown and other sections of St. Louis. To the east, I-64 serves the primarily agricultural areas of southern Illinois. Planned improvements include a direct I-255-270 connector which will complete an Interstate circumferential highway around the city and help relieve congestion on the Poplar Street bridge.



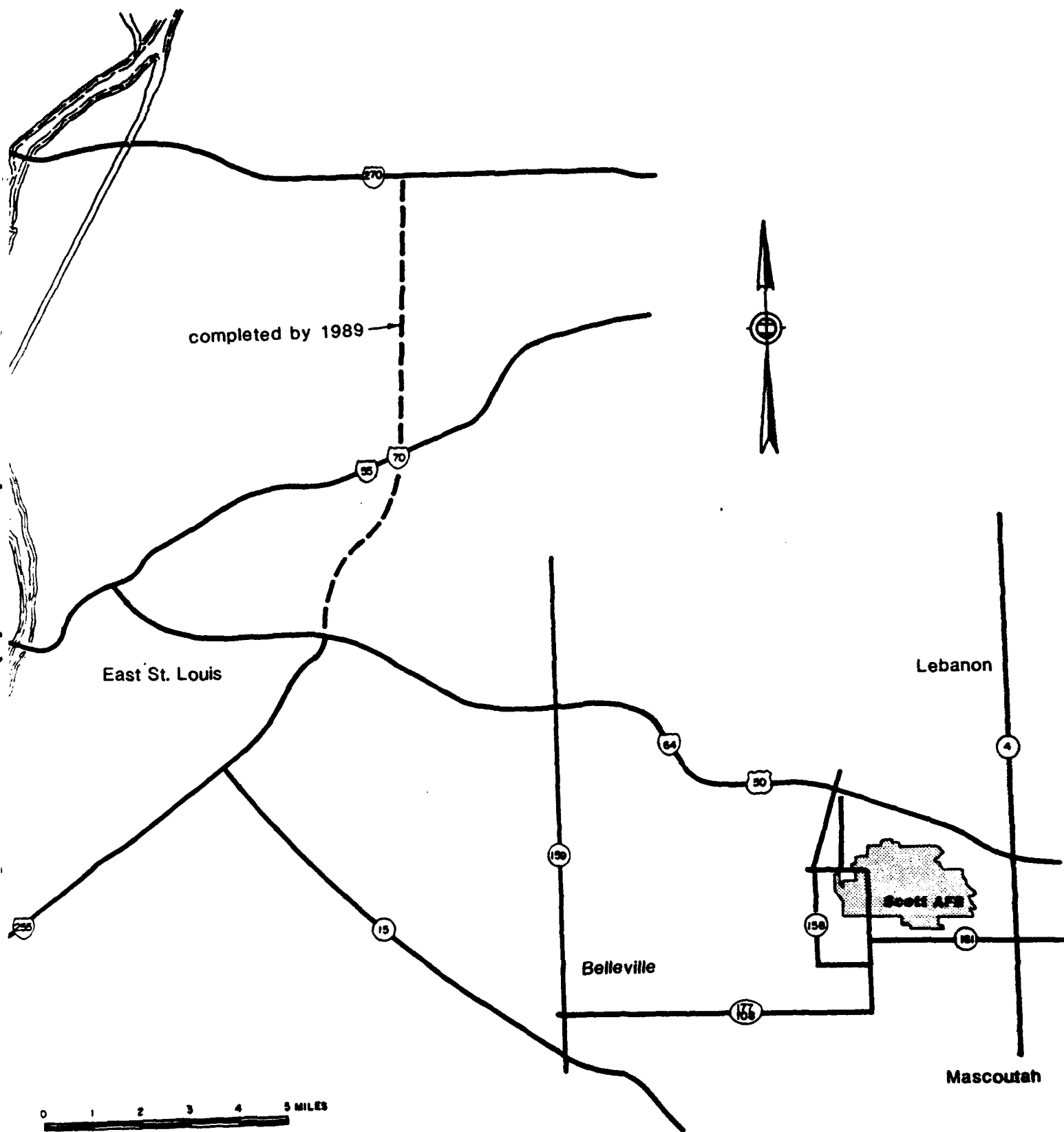


Figure 8-1
REGIONAL HIGHWAY SYSTEM

8.22 Local Highway Access

Initial site development calls for provision of a cargo terminal and commuter operations at the southeast end of the existing runway. Primary access to this site is currently provided via a restricted military gate off Route 161, served primarily by the Route 4 and secondarily by the Route 158 interchanges with I-64. These interchanges serve travel from the north, east, and west. The Belleville area, to the southwest of the site, is the major population center dependent on local access, which is afforded by Routes 158 and 161, providing a direct east-west connection.

The current access pattern involves crossing a railroad grade crossing just north of Route 161, which is used by 4-5 trains per day and crossing the clear zone of the active runway. To avoid these conflicts, as well as to segregate the military and civilian access, a new access road from Route 4, running parallel to route 161 just north of the railroad tracks, is proposed. The new road will enter the site directly at the proposed air cargo parking area and avoiding the planned waste treatment facility.

This site will be adequate for initial stages of development. However, later forecasts require more extensive aviation and ground access facilities. Passenger terminals are located to the north and a new interchange off I-64 is proposed.

8.3 Airport Traffic Generation, Distribution and Assignment

8.31 Vehicular Trip Generation

Airport trip generation was calculated for the years 1990, 1995, 2000, and 2005 for the user groups described below:

- o Employees;

- o Air passengers (commercial airlines and commuter airlines);
- o Air cargo; and
- o General aviation.

Peak hour trips by group and the sources for the calculations are presented in Tables 8-1, 2, and 3. Table 8-1 shows employee and passenger trip generation. In terms of employees, total employment for the four years in question (1) was factored into a 71.5% average weekday employment (7). Of those working, 30% were assigned to the peak hour (11). In a conservative "worst case" approach, auto use was assumed to be 100%, with a vehicle occupancy of 1.15 (9). The high percentage auto use was supported by a 1969 Lambert Airport study which, although dated, showed employee bus ridership at a low 1.4% (8). A directional distribution of 60% peak direction (exiting the airport in the p.m. peak hour and entering the airport in the a.m. peak hour) and 40% off-peak direction (entering the airport in the p.m. peak hour and exiting the airport in the a.m. peak hour) was used (2).

For passengers, peak hour estimates were obtained by converting annual passengers (1) into peak month and average day estimates. Then, a factor of 12% peak hour trips was used (1). The conservative assumption was made that auto use (including limousines and taxis) would be 100%, and the further assumption was made that 50% of vehicle trips would park at the airport and 50% would involve dropoffs (one exiting and one entering trip) (2).

Airport service trips were then estimated using a figure of 10% of the total employee and passenger trips (2) in the peak and offpeak directions.

TABLE 8-1
SCOTT AIR FORCE BASE GROUND ACCESS FEASIBILITY STUDY
EMPLOYEE AND PASSENGER PEAK HOUR VEHICULAR TRIP GENERATION

CATEGORY	1990	1995	2000	2005
EMPLOYEES: TOTAL	240	300	1515	3440
% working (weekday)	71.5	71.5	71.5	71.5
# working	172	415	1083	2460
% peak hour	30	30	30	30
# peak hour	51	124	325	738
Vehicle occ.	1.15	1.15	1.15	1.15
# peak vehicles/peak direction	45	108	283	642
# peak veh/off-pk dir (40%)	30	72	188	428
ANNUAL PASSENGERS (originating)	45000	150000	550000	1200000
Peak month (10% annual pass.)	4500	15000	55000	120000
Av. day (.033 x peak month)	148	495	1815	3960
% peak hour	12	12	12	12
# peak hour	18	59	218	475
ENTERING				
50% park - 1 trip peak dir	9	30	109	238
50% drop - 1 trip peak dir	9	30	109	238
50% drop - 1 trip offpk dir	9	30	109	238
EXITING				
50% park - 1 trip offpk dir	4	13	47	102
50% drop - 1 trip offpk dir	4	13	47	102
50% drop - 1 trip peak dir	4	13	47	102
Total employee + pass (peak dir)	67	181	548	1220
Service trips peak dir (10%)	7	18	54	112
Total: peak direction	74	199	602	1332
Total employee + pass (offpk dir)	47	128	391	870
Service trips offpk dir (10%)	5	13	39	87
Total: offpeak direction	52	141	430	957

Table 8-2 summarizes the estimation procedure for air cargo and general aviation trips. Cargo trips were based on annual operations (1) factored to peak hour operations by use of a standard factor of .03% (2). The operations were then translated into tonnage by multiplying the number of operations by the capacity of the aircraft and the average load factor. The tonnage was then converted to numbers of trucks by assuming 7 tons/truck (2), and the trucks were converted to passenger car equivalents (PCE's) by using a factor of 2 (2). A directional distribution of 50% in the peak direction and 50% in the offpeak direction was used (2).

Peak hour general aviation operations (1) were converted into vehicle trips by using a factor of 2 peak direction trips per operation. A directional distribution of 70% peak, 30% off peak (2) was used.

An important component of the proposed airport is package forwarding operations. While these carriers will operate 20 peak hour aircraft in 1995 and 40 in 2005, the peak for these carriers is between 7 p.m. and 7 a.m. (1) and thus does not coincide with other peak traffic periods.

Peak hour vehicular trip generation is shown in Table 8-3. As shown, there are 82 peak hour trips in the peak direction (exiting the airport in the p.m. or entering the airport in the a.m.) generated by the airport in 1990, increasing to 1379 trips in 2005. Similarly, offpeak direction trips (entering the airport in the p.m. or exiting the airport in the a.m.) increase from 60 in 1990 to 993 in 2005.

TABLE 8-2
SCOTT AIR FORCE BASE GROUND ACCESS FEASIBILITY STUDY
AIR CARGO AND GENERAL AVIATION PEAK HOUR VEHICULAR TRIP GENERATION

CATEGORY	1990	1995	2000	2005
CARGO: ANNUAL OPERATIONS	1200	1800	3000	4200
% peak hour	.03	.03	.03	.03
# peak hour	.36	.54	1	1
b747 Capacity (tons)	125	125	125	125
Load Factor (%)	60	60	60	60
Average Load (tons)	75	75	75	75
Tons/Peak Hour	27	40	67	94
Number trucks (7 tons/truck)	3	5	9	13
Pass. car equiv (2.0) - peak dir	8	12	19	27
Pass. car equiv off peak dir (30%)	8	12	19	27

CATEGORY	1990	1995	2000	2005
GEN. AVIATION: ANNUAL OPS	0	1200	16000	30000
PEAK HOUR OPERATIONS	0	1	5	10
Veh. entries per operation	2	2	2	2
Peak hour veh. trips - peak dir	0	2	10	20
Peak veh trips - offpk dir (30%)	0	1	4	9

TABLE 8-3
SCOTT AIR FORCE BASE GROUND ACCESS FEASIBILITY STUDY
SUMMARY OF PEAK HOUR VEHICULAR TRIP GENERATION BY USER GROUP

CATEGORY	1990	1995	2000	2005
PEAK DIRECTION:				
Employees	45	108	283	442
Passengers	22	73	245	578
Airport Service Vehicles	7	17	54	112
Air Cargo	8	12	19	27
General Aviation	0	2	10	20
TOTAL PEAK DIRECTION	82	212	631	1379
OFF PEAK DIRECTION				
Employees	38	72	188	428
Passengers	17	56	203	442
Airport Service Vehicles	5	13	39	87
Air Cargo	8	12	19	27
General Aviation	0	1	4	9
TOTAL	60	154	453	993

8.32 Trip Distribution

Total vehicular trips were assigned to the street system in accordance with a logical approach direction by user group. The basis for these assignments is discussed below.

- o Employees: Employees were assigned to travel corridors based on regional population, adjusted to reflect the fact that employees will tend to live in areas closer to the airport. St. Louis SMSA 1980 U.S. Census data showed 93% of the regional population living in the areas to the west of Scott Air Force Base, 2% living to the north, 3% living to the south, and 2% living to the east. However these figures were adjusted to allot a higher proportion of employment (20%) to the city of Belleville, to the south of the new site, 5% to the north, 5% to the east, and 70% to the west to account for employee's ability to move closer to the airport.
- o Passengers and General Aviation: Passengers were assigned as follows; 80% from the west on I-64, 10% from the east on I-64, and 10% from the south (Belleville), based on population and employment distribution.
- o Cargo: Air cargo and service vehicle trips were assigned to I-64 -- 80% from the west, and 20% from the east.

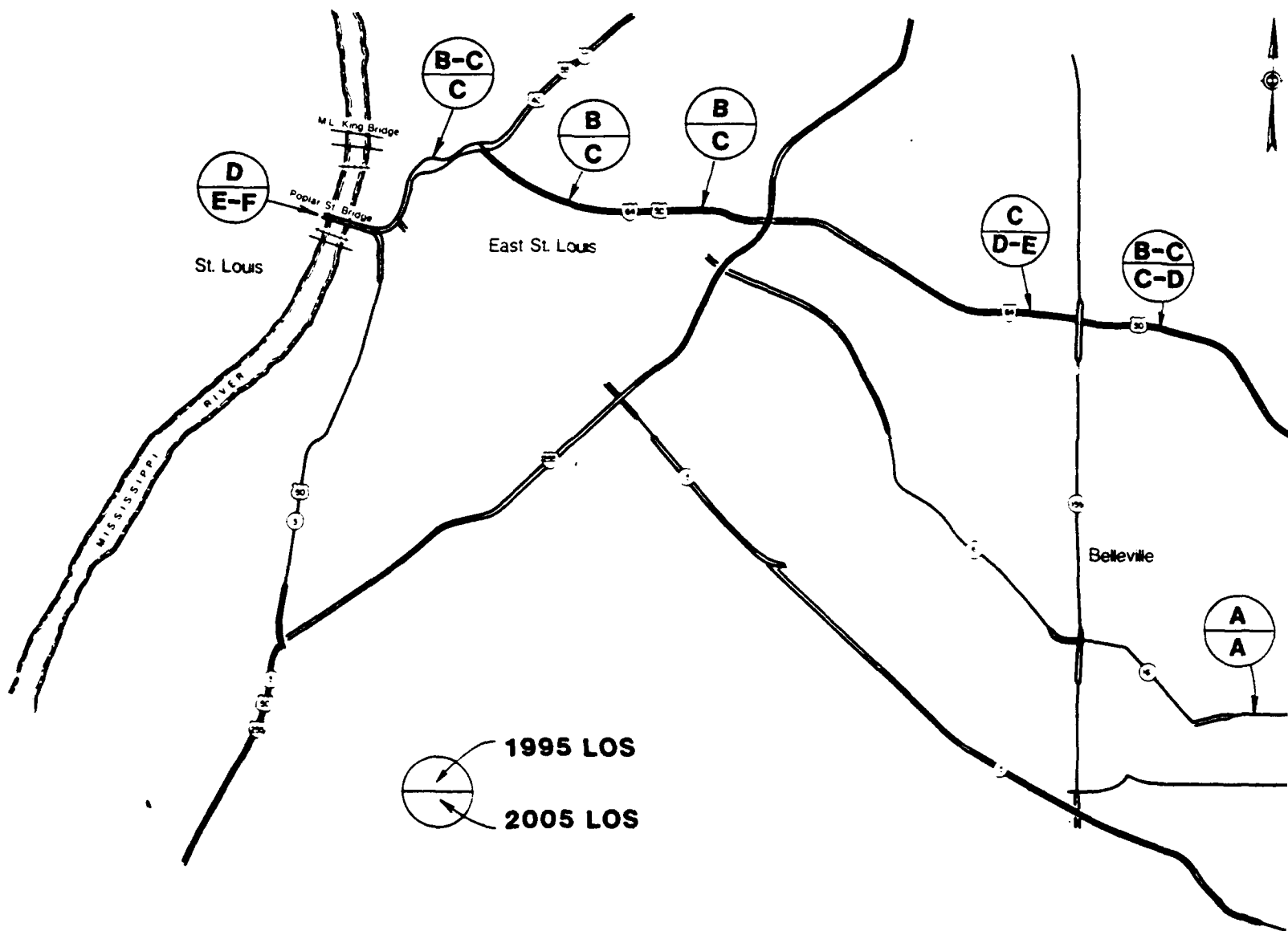
Once logical directions of approach were determined, trips were assigned to specific roadways in the region. In terms of immediate airport access, all 1995 trips were assigned to the new Route 4 entrance, proceeding to the Route 4 interchange with I-64 or turning to Route 161 to the south. Trips in 2005 were assigned either to the proposed interchange with I-64 or to the Route 4 entrance, based on likely location within the airport (i.e. commercial terminal, air cargo area, general aviation area, etc.).

Commercial passengers were assigned to the new interchange, and commuter airline passengers were assigned to Route 4. The results of this process are summarized in Tables 8-4 and 8-5, using the peak departing hour for employees (P.M. peak).

8.4 Traffic Volumes and Capacity Analysis

Base year peak hour traffic volumes (non airport-related) for 1995 and 2005 from counts and forecasts supplied by Illinois DOT (5) were derived as shown in Table 8-6. Peak hour volumes were obtained by using a factor of 9% of ADT flows for the Interstate inside Route 255, 10% for the remainder of I-64, 12% for Route 4 and 15% for Routes 158/161 (4).

Capacity analysis of roadway segments affected by the proposed airport is shown in Tables 8-7 and 8-8. Analysis was conducted according to the 1985 Highway Capacity Manual (10), as described in Appendix 8-1. Airport traffic was added to the street system as follows. Entering airport volumes (predominantly eastbound) were added to the peak direction flows (outbound from St. Louis) for the p.m. peak hour, and exiting volumes (predominantly westbound) were added to the offpeak direction flows (inbound to St. Louis). Where airport volumes coincided with the roadway peak direction, however, (i.e., p.m. peak hour eastbound exiting airport traffic), they were added to the peak direction volumes. The 1995 peak hour peak direction scenario with airport traffic added shows no roadway segments operating below Level of Service (LOS) C, with the exception of the Poplar Street Bridge, which operates at D. In the offpeak direction, no segment operates below LOS B. In 2005, the bridge operates at LOS E-F in the peak direction, and several other segments approach LOS D-E, notably I-64 west of 159 and Route 4 north of the airport exit. In the offpeak direction, however, no segments exceed LOS C. Figure 8-2 shows predicted levels of service for the years 1995 and 2005 on key highway links.



1 2 3 4 MILES

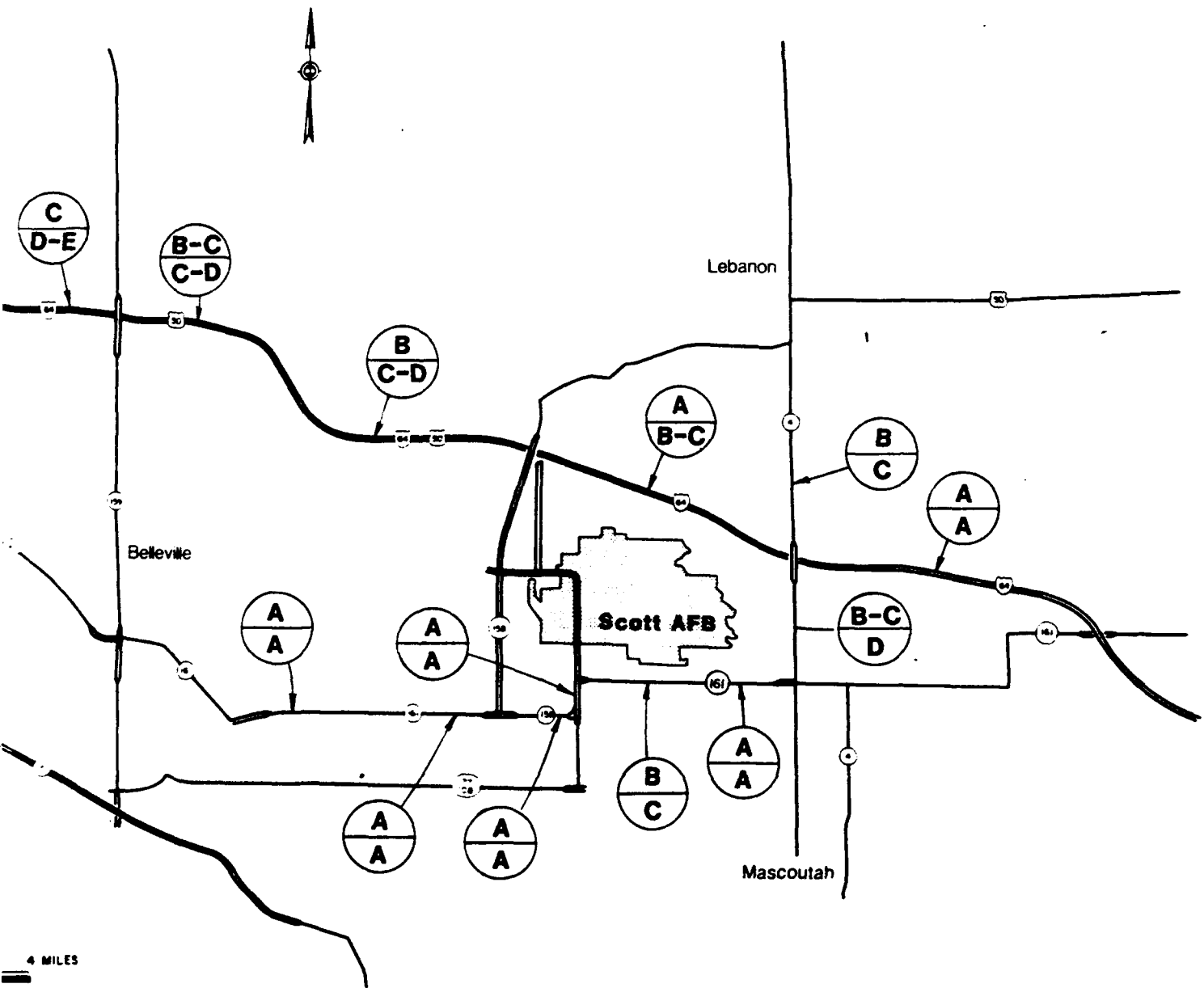


Figure 8-2
LEVEL OF SERVICE ANALYSIS

TABLE 8-4
SCOTT AIR FORCE BASE GROUND ACCESS FEASIBILITY STUDY
PEAK HOUR VEHICULAR TRIP DISTRIBUTION BY USER GROUP: 1995

CATEGORY	1995						
	TOTAL AT AIRPORT EXIT	TO ROUTE 4 (LEFT TURN)	TO RTE 161 (RIGHT TURN)	TO WEST I-64 (ROUTE 4 INTERCH)	TO EAST I-64 (ROUTE 4 INTERCH)	TO BELLEVILLE (ROUTE 158)	NORTH ON ROUTE 4
EXITING:							
Passengers	73	66	7	58	7	7	0
General Aviation	2	2	0	2	0	0	0
Employees	108	86	22	76	6	22	5
Airport Service	17	17	0	14	3	0	0
Cargo	12	12	0	10	2	0	0
Total exiting:	212	183	29	160	18	29	5
CATEGORY	1995						
	TOTAL AT AIRPORT ENTRANCE	FROM ROUTE 4 (RIGHT TURN)	FROM ROUTE 161 (LEFT TURN)	FROM WEST I-64 (ROUTE 4 INTERCH)	FROM EAST I-64 (ROUTE 4 INTERCH)	FROM BELLEVILLE (ROUTE 158)	FROM NORTH ROUTE 4
ENTERING:							
Passengers	56	58	5	45	6	6	0
General Aviation	1	2	0	1	0	0	0
Employees	72	58	14	50	4	14	3
Airport Service	13	13	0	10	3	0	0
Cargo	12	12	0	10	2	0	0
Total entering:	154	135	19	116	15	20	3

TABLE 8-5
SCOTT AIR FORCE BASE GROUND ACCESS FEASIBILITY STUDY
PEAK HOUR VEHICULAR TRIP DISTRIBUTION BY USER GROUP: 2005

CATEGORY	TOTAL AT AIRPORT EXITS	2005						
		TO WEST I-64 (NEW (INTERCH)	TO EAST I-64 (NEW (INTERCH)	TO WEST I-64 (ROUTE 4 (INTERCH)	TO EAST I-64 (ROUTE 4 (INTERCH)	TO BELLEVILLE (NEW (INTERCH)	TO BELLEVILLE (ROUTE 4 (ENTRANCE)	NORTH ON ROUTE 4
EXITING:								
Commercial Air Passengers	549	439	55	0	0	55	0	0
Commuters	28	0	0	23	3	3	0	0
General Aviation	20	0	0	16	2	2	0	0
Employees	642	385	16	64	16	64	64	32
Airport Service	112	45	11	45	11	0	0	0
Cargo	27	0	0	22	5	0	0	0
Total exiting:	1378	869	82	170	37	124	64	32

CATEGORY	TOTAL AT AIRPORT ENTRANCES	FROM WEST I-64 (NEW (INTERCH)	FROM EAST I-64 (NEW (INTERCH)	FROM WEST I-64 (ROUTE 4 (INTERCH)	FROM EAST I-64 (ROUTE 4 (INTERCH)	FROM BELLEVILLE (NEW (INTERCH)	FROM BELLEVILLE (ROUTE 4 (ENTRANCE)	FROM NORTH ROUTE 4
ENTERING:								
Commercial Air Passengers	419	336	42	0	0	42	0	0
Commuters	26	0	0	18	2	0	2	0
General Aviation	9	0	0	7	1	1	0	0
Employees	428	257	11	43	10	43	43	21
Airport Service	87	35	9	35	9	0	0	0
Cargo	27	0	0	22	5	0	0	0
Total entering:	993	628	62	125	28	86	45	21

TABLE 8-6
DERIVATION OF 1995 AND 2005 BASE YEAR PEAK HOUR TRAFFIC VOLUMES
(NON-AIRPORT RELATED)

LOCATION	CHARACTERISTICS	1985	1995 ADT	PEAK HOUR	PEAK DIR	OFF-PK DIR	2005 ADT	PEAK HOUR	PEAK DIR	OFF-PK DIR
I-44 bridge	8 12' lanes, 4' shoulder	118000	108200	12020	7690	4330	107500	11700	7660	3940
I-44, next east	10 12' lanes, 12' shoulder	94300	104800	10650	7220	3430	121000	12300	8165	4135
I-44, next east	6 12' lanes, 12' shoulder	50700	56400	5405	3660	1745	62000	6270	4345	1928
I-44, just west of I-255	6 12' lanes, 12' shoulder	43400	48500	4630	3130	1500	53000	5370	3720	1650
I-44 west of 159	4 lane, 48', 12' shoulder	33100	40200	4020	2613	1407	47300	4730	3074	1455
I-44, next east	4 lane, 48', 12' shoulder	28250	33075	3307	2149	1157	37900	3790	2463	1324
I-44, next east	4 lane, 48', 12' shoulder	22100	30000	3000	1950	1050	37900	3790	2463	1326
I-44 between 158 and 4	4 lane, 48', 12' shoulder	15800	18300	1830	1189	640	20800	2080	1352	728
I-44, East of Route 4	4 lane, 48', 12' shoulder	14350	16075	1607	1044	562	17800	1780	1157	623
Rte 4, north of airport exit	2 lane, 30', no shoulder	3500	4250	510	306	204	5800	600	360	240
Rte 4, north of I-64	2 lane, 30', no shoulder	3150	4575	549	329	219	6800	728	432	208
Route 161, west of Route 4	4 lane, 36', 10' shoulder	4800	5300	795	477	318	5800	870	522	348
Route 161, turn to Route 158	2 lane, 24', 10' shoulder	5050	5525	828	497	331	6000	900	540	360
Route 158, at turn with 161	4 lane, 60', no shoulder	9500	10450	1567	940	627	11400	1710	1026	684
Route 158, west of turn	4 lane, 60', no shoulder	9800	10800	1620	972	648	11800	1770	1062	708
Route 158/161, west of n-s 158	4 lane, 60', no shoulder	10500	11550	1732	1039	693	12600	1898	1134	756
Route 161, further west	4 lane, 60', no shoulder	11700	12850	1927	1156	771	14000	2100	1260	840
SR link to 158/177	2 lane, 24', 10' shoulder	2300	2550	382	229	153	2800	420	252	148
158/177 - on to Belleville	2 lane, 20', no shoulder	4600	5100	765	459	306	5600	840	504	336

TABLE 8-8
VOLUME CAPACITY ANALYSIS OF ROADWAY SEGMENTS SHOWING AIRPORT ADDED TRAFFIC
2005

LOCATION	CHARACTERISTICS	MAXIMUM SERVICE FLOW *	BASE 2005		PROJECT		TOTAL		VOLUME/ CAPACITY RATIO		LEVEL OF SERVICE	BASE 2005		PROJECT		TOTAL		VOLUME CAPACITY RATIO		LEVEL OF SERVICE
			PEAK DIR (OUTBOUND)	PEAK DIR (ENTERING)	PEAK DIR (OUTBOUND)	PEAK DIR (ENTERING)	2005 PEAK DIR	2005 PEAK DIR				OFF-PK DIR (INBOUND)	OFF-PK DIR (EXITING)	2005 OFF-PK DIR	2005 OFF-PK DIR	2005 OFF-PK DIR	2005 OFF-PK DIR			
I-64, bridge to St. Louis	8 12' lanes, 4' shoulder	7920	7640	251	7911	0.99	E-F	3940	313	4253	C	0.53								
I-64, next east	10 12' lanes, 12' shoulder	10000	8165	251	8416	0.84	D-E	4135	313	4448	B	0.44								
I-64, next east	6 12' lanes, 12' shoulder	6000	4345	251	4596	0.76	D	1928	313	2241	B	0.37								
I-64, just west of I-255	6 12' lanes, 12' shoulder	6000	3720	753	4473	0.74	D	1650	939	2589	B	0.43								
I-64 west of I-59	4 lane, 48', 12' shoulder	4000	3074	753	3827	0.95	D-E	1655	939	2594	C	0.64								
I-64, next east	4 lane, 48', 12' shoulder	4000	2463	753	3216	0.80	C-D	1326	939	2265	B-C	0.56								
I-64, next east	4 lane, 48', 12' shoulder	4000	2463	753	3216	0.80	C-D	1326	939	2265	B-C	0.56								
I-64 between I-50 and 4	4 lane, 48', 12' shoulder	4000	1352	839	2191	0.54	B-C	728	1163	1891	B	0.47								
I-64, East of Route 4	4 lane, 48', 12' shoulder	4000	1157	119	1278	0.31	A	423	90	713	A	0.17								
Site 4, north of airport exit	2 lane, 30', no shoulder	2263	360	219	579	0.46	D	240	239	479										
Site 4, north of I-64	2 lane, 30', no shoulder	2263	432	21	453	0.34	C	288	32	320										
Route 161, west of Route 4	4 lane, 36', 10' shoulder	2780	522	45	547	0.20	A	348	64	412	A	0.14								
Route 161, turn to Route 150	2 lane, 24', 10' shoulder	2632	540	45	585	0.38	C	360	64	424										
Route 150, at turn with 161	4 lane, 60', no shoulder	3610	1026	45	1071	0.29	A	484	64	748	A	0.20								
Route 150, west of turn	4 lane, 60', no shoulder	3610	1062	45	1107	0.30	A	708	64	772	A	0.21								
Route 150/161, west of s-s 150	4 lane, 60', no shoulder	3610	1134	131	1265	0.35	A	756	188	944	A	0.26								
Route 161, further west	4 lane, 60', no shoulder	3610	1260	131	1391	0.38	A	840	188	1028	A	0.28								

* See Appendix A, pp. 10-19

8.5 Parking and Curbspace

The parking requirements for Scott's civilian facility were estimated by using the forecasts of employee and passenger demand contained in Table 8-1. Seventy (70) percent of daily employee vehicles were assumed to be parked in the peak accumulation period. One-half of air passengers were assumed to park - with maximum accumulation equal to the total parked on the design day. Table 8-9 indicates the total forecast parking demand for the various design years. The totals work out to between 30-50 percent greater than annual passengers divided by 1,000 which is consistent with other airports of this size.

Table 8-9

Number of Parking Spaces Required

	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Employees	105	250	660	1,500
Air Passengers	<u>75</u>	<u>250</u>	<u>910</u>	<u>1,980</u>
TOTAL	180	500	1,570	3,480

The vehicle arrival rates in Table 8-1 were factored to estimate curbspace (12), average dwell times of 2.5 minutes, and a length of 25 feet per space were assumed. Results are shown in Table 8-10.

8.6 Light Rail Transit System

There is currently underway a study for a Light Rail Transit (LRT) system from E. St. Louis, Illinois, through the St. Louis CBD to Lambert International Airport. In addition, the East-West

Gateway Coordinating Council has added the study of 3 corridors into Illinois, one of which is the Fairview Heights-Belleville area. Commercial service at Scott could add justification for extending the Light Rail Transit (LRT) west, with a potential connection to Scott.

Table 8-10

Curb Space Requirements

	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Peak Hour Arrivals	18	60	218	476
Spaces Required	3	6	13	25
Length Required (Feet)	75	150	325	625

8.7 Conclusions and Recommendations

The capacity analysis indicates that, even with little or no highway improvements, ground access to Scott Air Force Base will present few problems in its initial stages (1995). Even by the year 2005, the only potential problem areas are Route 4 between the airport entrance and I-64, some segments of I-64 which are currently 4 lanes, and the Poplar Street Bridge. Route 4 can be easily widened to 4 lanes to accommodate airport traffic. I-64 is designed to be easily widened to 6-lanes and it is reasonable to expect that this will happen by 2005. A number of factors should mitigate any problems with the bridge, as discussed below:

- o The states of Missouri and Illinois are now looking at means of improving the other bridges over the Missouri which are currently greatly underutilized and could pick up much of the Poplar Street Bridge traffic.

- o A study is currently underway to improve Illinois approaches to the Poplar Street Bridge.
- o Completion of the I255/I270 ring road should divert some traffic from the Poplar Street Bridge.
- o Substantial improvements to Base access and internal roads does not appear necessary.

Therefore, ground access is seen as a major positive aspect of the Scott Air Force Base location. Even the minor problems cited above concern traffic in the peak commuting direction, which is opposite to the peak direction for airport travel.

Recommendations for ground access improvements are as follows:

1. Provide a new entrance for civil use only off Route 4 just north of the railroad tracks. This should be a secured access, precluding civil access to the military facilities.
2. Improve Route 4 between the airport entrance and I-64. Initially, a wider shoulder and turning lanes into the airport would be sufficient. In later stages, 4 lanes and a traffic signal may be needed.
3. If a major passenger terminal is built in the recommended location, construct an additional I-64 interchange and access road to the terminal area.

SOURCES

1. Tippetts-Abbett-McCarthy-Stratton, Traffic Forecasts, Scott Air Force Base, 1986.
2. Tippetts-Abbett-McCarthy-Stratton, Stewart Airport Master Plan Study: Final Report, New York State Department of Transportation, February, 1984.
3. Cambridge Systematics, Inc., Logan Airport Travel Surveys, 1979 and 1984.
4. Illinois Department of Transportation, "Week Long Machine Counts, I-64, IL 177, IL 161, IL 4, 1985.
5. Illinois Department of Transportation, memorandum March 11, 1986.
6. U.S. Census of Population and Housing, St. Louis SMSA, 1980.
7. Central Transportation Planning Staff, "Ground Traffic Generated by Logan Activities," staff memorandum, 1982.
8. Crawford, Bunte, Roden, Inc. Travel Characteristics of Employees, Lambert-St. Louis Municipal Airport, 1969 p.5.
9. Tippetts-Abbett-McCarthy-Stratton, Recommended Parking and Vehicular Access Facilities, January, 1969.
10. National Research Council, Transportation Research Board, Highway Capacity Manual, Special Report 209, Washington, D.C. (1985).
11. Tippetts-Abbett-McCarthy-Stratton, Anchorage International Airport Surface Transportation Study, Phase I Report, September, 1982.
12. Tilles, Richard, Curbspace at Airport Terminals, Traffic Quarterly, October, 1983.

Section 9 Environmental Impacts

9.1 General

This section discusses the potential environmental impacts associated with the development and operation of Scott AFB for joint military and civil use. It reviews the existing environmental conditions in the area and examines potential impacts of the short term (1990) and long term (1995-2005) development proposed.

Field investigations included contacts with the U.S. Army Corps of Engineers, Geological Service, Air Force, Soil Conservation Service, the Illinois Environmental Protection Agency, the Metropolitan and E. St. Louis Planning Commission and the State Office of Historic Preservation.

This environmental analysis is for purposes of exploring the environmental feasibility of joint use development of Scott AFB. It is not intended to be an official environmental impact assessment or statement. Thus, it does not conform to the standards for format, scoping, depth of analysis or content required by the FAA, U.S. DOT and the Presidents Council on Environmental Quality (CEQ) in accordance with the National Environmental Policy Act (NEPA). This preliminary assessment concludes that it will be environmentally feasible to develop Scott AFB for joint use in the manner proposed.

Paragraphs 9.2 and 9.3 discuss impacts other than those associated with aircraft noise. Paragraph 9.4 addresses aircraft noise impact.

9.2 Short Term Impacts

The potential short term impacts investigated relate to the proposed development and air traffic levels that will occur in the 1990 time frame. The short term development includes upgrading the existing runway/taxiway complex for interim civil use and enhancement of military operations. Also, minimal terminal facilities will be constructed for the introduction of civil passenger service and a terminal complex will be developed to initiate package express and all cargo activity. The proposed development is discussed in Sections 5 and 6. The air traffic activity anticipated as a result of the development is discussed in Section 3.

9.21 Ecology, Wetlands and Flooding

The short term runway expansion, installation of a parallel taxiway, and construction of airport facilities will not directly impact wetlands or the 100 year floodplain associated with Silver Creek. These expansions will occur only on disturbed uplands and will not involve wetland filling.

Runoff from the paved surfaces on Scott AFB will be increased. This effect will be due to drainage from the 60 acres of impermeable surfaces created as a part of this action. To prevent this increased runoff from having any significant exacerbating effect on existing flooding (see par 9.31), stormwater retention will be a part of the design. The retention of runoff from both the new facilities and some older AFB facilities for 18 to 24 hours on upland sites will allow the peak flood to pass before adding AFB runoff to the flow. This action will not only mitigate impacts due to increased runoff but will aid in solving the existing flooding problems in the Creek.

As a result of these factors, the short term plan will have no significant impact on wetlands or flooding.

No state or federally endangered or threatened species are known to utilize Scott AFB as critical habitat. Additionally, it is not used as a hunting or fishing resource.

9.22 Prime Farmlands

The runway expansion and part of the parallel taxiway will minimally impact productive farmlands. The area of farmland affected by this expansion will be about 15 acres. The soil in this area is Atterberry silt loam with a slope of 0 to 3 percent. Since this soil and topography are part of the Soil Conservation Service Type I Management Group, they are considered prime farmlands in the State of Illinois. The balance of the new short term airport facilities would be constructed on disturbed Scott AFB lands. These lands were cut, filled and previously had buildings constructed on them (i.e., The old roadway system and concrete foundations are evident). Therefore, these short term airport facility plans would not impact prime farmlands. Also, since the runway/taxiway expansion would occupy a very small fraction of available prime and important farmland in the County (which totals 335,000 acres), the impact to local agriculture is insignificant.

9.23 Archaeological and Historic Factors

The Silver Creek stream basin has a high potential for archaeologically significant sites (see par. 9.33) and the proposed runway expansion occurs on the fringes of that basin. The area is already disturbed by farming. However, it is on the fringes of a drainageway where significant artifacts are likely to be deposited after being washed downstream. Farming of this area would only disturb the upper 12 to 18 inches of the soil and significant findings are likely to occur at greater depths.

Hence, a subsurface archaeological analysis may be required for a master plan level environmental assessment or impact statement of the short range plan.

The proposed short term facilities expansions would occur on lands cut, filled and previously developed for Scott AFB buildings. The potential for archeologically sensitive sites occurring in the short term expansion area is minimal.

The closest historic sites to Scott AFB occur 0.5 miles east toward Mascoutah and 1.5 miles northwest in Shiloh. These structures in Shiloh will be unaffected by the near term expansion plans at the Base. The Mascoutah structure may require further analysis.

9.24 Socioeconomic and Community Factors

The short term expansion plans for Scott AFB would be reasonably compatible with existing base activities and community facilities. At first the expansion will bring relatively limited commercial traffic by comparison to Lambert International Airport and Scott AFB military traffic. The associated commercial passenger traffic will also be relatively small by comparison to the 3,700 civilians, 4,200 military dependents and 6,900 military personnel who currently work and/or live on the Base and by comparison to the County's 260,000 residents (1980 census data). Additionally, the fewer amenities and schedules available compared to Lambert International would probably make commercial schedules to and from Scott AFB less attractive to the business traveler. These factors will tend to limit initial demand for services to a minimum outside of the Base and few changes in land use would probably occur around it. However, it should be noted that speculation in anticipation of the long range plan could lead to changes in property ownership. Such changes should be monitored to help determine subsequent long range effects.

No recreational facilities (i.e., Scott AFB golf course or Mascoutah Lake) will be impacted other than by additional intrusive noise as described in Paragraph 9.4 of this report.

9.25 Miscellaneous Factors

Air quality in St. Clair County is largely determined by air pollutants carried eastward from St. Louis. The six criteria pollutants are sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone (hydrocarbons), particulates and lead. Most of the ambient air quality monitors in St. Clair County occur in East St. Louis, approximately 15 miles from Scott AFB. Only ozone regularly exceeds its National Ambient Air Quality Standard (NAAQS) of 0.12 ppm (1 hour average) in East St. Louis. However, the level of this air pollutant at Scott AFB is probably much lower than in East St. Louis due to the diluting effects of the distance between them. Hydrocarbons are emitted from aircraft engines, but the primary source of this pollutant is motor vehicles. With the existing levels of vehicular and aircraft activity on the Base, it is not expected that the initial expansion will cause a substantial rise in either mobile source emissions or ambient levels of hydrocarbons. The major component of aircraft pollutant emissions is carbon monoxide. This pollutant is within its NAAQS at the St. Clair County monitoring station in East St. Louis. The volume of carbon monoxide emitted from the 33 daily commercial aircraft operations in the initial expansion will be very small. Consequently, the air pollution impact of this short term plan will probably be minimal and the carbon monoxide NAAQS will be maintained.

9.3 Long Term Impacts

The potential long term impacts relate to the proposed development and air traffic levels that will occur through the year 2005, the 20 year planning horizon. Major development is expected to occur as the potential growth of civil traffic is realized. The most significant development will be the construction of a new parallel runway 14L/32R, 6500 ft. from the existing runway. This runway and its associated taxiways and terminal complexes for passenger and cargo activity will be placed adjacent to Silver Creek, impacting on its associated wetlands and floodplain.

9.31 Ecology, Wetlands and Flooding

Wetlands (as defined by the U.S. Army Corps) and 100 year floodplains (as defined by the Federal Emergency Management Agency, FEMA) associated with Silver Creek begin 0.25 miles east of the existing runway and range in width from 0.25 north toward U.S. I-64 to 0.75 miles south toward State Route 161.

Wetland vegetation is dominated by trees occurring in the floodway. These trees consist of maple (Acer spp.), willow (Salix spp.), tupelo (Nyssa spp.), and sycamore (Platanus spp.). Buttonbush (Cephalanthus occidentalis) is scattered throughout the wetland. The main channel of Silver Creek is 50 to 60 feet wide and 10 to 15 feet deep. It is devoid of vegetation due to the scouring effect of excessively strong flood flows. However, other areas of open water are found in pools and secondary channels throughout the wetland. These areas have some emergent, herbaceous vegetation including sedges (Carex spp.) and rushes (Juncus spp.).

The floodplain in Silver Creek extends past the forested wetland to the elevation 431 ft. above mean sea level. This

elevation does not affect the existing runway. The floodway occupies all of the wetlands in the northern portions of Silver Creek (just south of U.S. I-64) and approximately 80 percent of the wetlands toward State Route 161. Currents in the floodway are severe. Flows have been measured at 4.0 to 5.0 cubic feet per second in the FEMA cross sections opposite Scott AFB, and up to 11.5 cubic feet per second under State Route 161.

This condition is being slowly ameliorated by Soil Conservation Service (SCS) activities in the County. This erosion and flood reduction program involves the construction of pressure controlled storm water retention structures which hold back up to 18 hours of runoff prior to discharge. This delayed runoff spreads the hydraulic "load" over a longer time period, and hence, decreases the maximum flood stage. Farms along Ash Creek, which drains the area immediately west and south of Scott AFB, have all been altered with these SCS erosion control devices, and it is reported that the Creek remained within its banks during a severe precipitation event in January, 1986. Some success has also been reported in Silver Creek north of U.S. I-64.

Long range plans will involve some flood plain, floodway and wetlands filling. To expand terminal and airfield facilities, approximately 200 acres of flood plain, floodway and wetland would be filled between the existing runway and Silver Creek's channel. Connecting taxiway's 1,500 feet long will be constructed across Silver Creek's channel and the remaining floodplain/wetland. These taxiways will occupy 5.0 acres. The parallel runway and taxiway will be constructed east of Silver Creek but its northern end will cross the flood plain and wetlands further north on Silver Creek. The new runway Creek crossing will occupy approximately 15.5 acres of wetlands. The new access roads from U.S. I-64 will not impact wetlands.

This development will require an individual Clean Water Act Section 404 permit. This permit and the State's 401 certificate would also satisfy the State's wetland and floodplain filling requirements. To support this application, a complete, on-site biota and natural resources inventory will be necessary. The impact analysis based on these data should address the following:

1. Wetlands mapping & filling.
2. Hydraulic and water quality implication of floodway filling.
3. Aquatic ecology impacts.
4. "Endangered" species.
5. Relative impacts of alternatives.
6. Mitigation of unavoidable impacts (i.e., by aiding the existing SCS program and retaining storm water runoff on airport uplands).

9.32 Prime Farmlands

The predominant land use surrounding Scott AFB is farming. These lands generally have gentle slopes and so are in prime and important farmland categories. The soils east of Silver Creek flood plains and west of State Route 4 are active farmlands totalling 1,000 acres. The soils occupying this area are as follows:

Soil Conservation Service Classification

<u>No.</u>	<u>Type</u>
46	Herrick, silt loam
165	Weir, silt loam
308B(2)	Alford, silt loam (1 to 4 percent slopes)
308C(2)	Alford, silt loam (4 to 10 percent slopes)
208D(2)	Alford, silt loam (10 to 18 percent slopes)
333	Wakeland, silt loam
454A	Iva, silt loam (0 to 2 percent slopes)

All of the above soils except the Alford silt loam with 10 to 18 percent slopes are prime or important farmlands.

The runway and general aviation area construction will require the acquisition of about 1,000 acres of active farmland. While this is a small fraction of the 335,000 acres now active in the County the agricultural, social and economic effects of this direct impact must be analyzed recognizing that continued use of much of the acquired land for agricultural purposes may be possible. The impact of planning alternatives is discussed in Section 5.

Secondary impacts of induced growth (see par. 9.34) must be related to farmlands (if any) taken out of production to facilitate this growth. The ripple effect of changes in land use would also have secondary effects on the agricultural support services economy in the County. It should be noted that these impacts are very complex and include impacts to tenants, farmer owners, farm productivity and even the distribution of family groups.

9.33 Archaeological and Historic Factors

The long term plans for Scott AFB expansion would disturb substantial areas of flood plains, flood plain edges and wetlands which have a reasonably high potential to have archaeologically significant artifacts or sites. This finding is based on the Southwestern and Metropolitan Area Planning Commission's 1973 Open Space and Historic Site Preservation Study. The study identifies the Silver Creek drainage way as an "Archaeological Area". This designation is due to the presence of a pre-columbian (1673) Indian mound known as the Emerald Mound in the upper reaches of Silver Creek north of U.S. I-64. The presence of this site could affect the Silver Creek drainageway as follows:

1. The mound suggests relatively intensive Indian activity in the area, and source of water was a prime location for habitation or concentrated use.
2. Artifacts associated with the mound or upland activities may have been washed downstream and been deposited in the floodway over many years.

To assess the archaeological impacts of the long term plans for Scott AFB joint use, a comprehensive surface survey and possibly a subsurface survey should be conducted. The impacts to any archaeologically important sites should also be addressed for both the proposed expansion and alternatives.

9.34 Socioeconomic and Community Factors

Existing economic and social conditions on the project site and in the region are dominated by two factors:

1. The 10,600 personnel working at Scott AFB with 4,200 dependents living on base.

2. Farming on the approximately 335,000 acres of prime or important farmland in St. Clair County and associated support industries.

As indicated in par. 9.24, the existence of the Base and relatively light commercial use (because of joint military use) will reduce the secondary impacts of the short term plan. Development of a second runway, however, will in 20 years expand commercial aircraft operations to 300 per day, making this airport much more convenient to the user, especially the traveller with business in St. Louis. The result would likely be a greatly expanded need for ground services to serve the expected 7,700 passengers per day, and perhaps, the establishment of primary airport businesses such as hotels, transportation services, trucking, etc. near Scott AFB. Additionally, other businesses may establish facilities in the region because of the improved access and these businesses would in turn attract their own set of support services. These support services range from messengers to housing for new employees. This is the classic scenario of primary growth directly related to the project and induced or secondary growth caused by but only indirectly related to the project. To mitigate this impact and direct this growth, County zoning laws might have to be adopted to balance the old agricultural economy with this new growth.

In order to properly assess the expected impacts of this future expansion, a detailed analysis of current social and economic factors should be compiled for the region (and the Base, if the current master plan becomes outdated). These factors need to be assessed in terms of current land use and zoning and possible land use changes due to the airport expansion and other processes of land use change. Especially important are increased employment, demand for housing, demand or allied uses, and increased demand for services. Impact analyses would predict

primary and induced changes in both the local and regional economy and its effect on the Base and County land use, zoning, transportation and demographics. This analysis would also closely relate to prime farmland impacts and the local agricultural service industry which this farming supports.

Local recreational facilities would not likely be impacted directly by this action, but must be examined for indirect impacts related to noise, air quality and induced land use changes.

9.35 Air, Waste and Miscellaneous Factors

Air pollution impacts for the long range expanded facility would have to be investigated through emissions and ambient air quality computer modeling. This EPA-approved modeling would predict emissions from aircraft and vehicular traffic, and translate these emissions to ambient air quality impacts.

Solid and hazardous waste impacts are also considerations for long range planning at Scott AFB. A 15 acres solid waste landfill occurs southeast of the existing runway. Also, a portion of this fill has been identified as containing hazardous wastes. Since the proposed 200 acre facility expansion would include this landfill, its impact to both the airport sponsor and airport users should be investigated. This impact analysis will be affected by expected, but as yet unavailable, Air Force closure plans for the landfill site.

Additional environmental factors to be addressed at the master plan level are as follows:

1. Traffic (noise, air and level of service)
2. Visual and aesthetics impacts
3. Navigation (day and night operations) and safety.

9.4 Aircraft Noise Impacts

Aircraft noise impacts projected in this study are keyed to the forecasts of air traffic activity discussed in Section 3 and the proposed airfield configuration discussed in Section 5. Also, Section 7 discusses the airspace and air traffic control relationships and the influence of approach and departure procedures on noise impacts and potential mitigation measures.

9.41 Effects of Noise

The measure of noise used in this study is Ldn, or Day-Night level. Ldn was adopted as the standard unit for use by the Federal Aviation Administration in 1980. It is a number representing the average energy from aviation noise over a 24 hour period, with noise during the night (10:00 p.m. to 7:00 a.m.) treated as though it were 10 db louder than the actual value. The effect is that the noise of an aircraft at night is treated as if it were the source of as much noise energy as ten daytime operations.

Although noise may be generated from many sources, this discussion is concerned only with aircraft noise. It is recognized that construction noise or traffic noise may often be louder than the noise from aircraft. However, because the consideration of noise from aircraft will be concerned with levels that may interfere with noise sensitive activities of people, and because of the rural setting of Scott Air Force Base, it is assumed that these other noise sources are not significant in the areas potentially affected by the proposed increase in activity at Scott.

The potential effects of noise are:

- o Effects on Hearing

- o Effects on Health
- o Effects on Communication
- o Effects on Sleep
- o Effects on Community Acceptance

Quoting from a summary study completed in 1984 (2), "Even with a margin of safety, no effects on hearing are expected below an Ldn of 75 db(A). Research on non-auditory effects on noise on health is continuing, but no evidence has yet been found of noise as a cause of disease at levels below that which may affect hearing. Somewhat more is known about noise interference with communication. While causing some interference with speech communication, a steady background noise of 60 db(A) still permits 95% speech intelligibility. An EPA group has estimated that fluctuating noise of 65 db(A) average (Leq) outdoors would permit the same level (95% intelligibility) of communication. This level outdoors would cause no problems with speech communication indoors. As regards sleep problems, some reactions, in terms of EEG activity, can be expected at essentially any noise level. Although levels of 40 db(A) have been recommended to avoid interference with sleep in hospitals, there is some evidence that more severe responses, such as awakening, require peak levels in the order of 85 db(A) outside to cause sleep impacts inside. Such levels are not likely to occur in areas, particularly with aviation noise, (with levels of) 65 Ldn outside. Finally, as noise increases, with any metric, so does community annoyance and adverse public reaction. However, an objective measurement of public annoyance is not easily defined."

In short, no specific adverse effects can be identified at noise levels below 65 Ldn. Above 65 Ldn, measurable significant adverse effects are limited, first, to speech communication, and

second, at somewhat higher levels, with sleep interference. Both can be mitigated inside with appropriate construction techniques. As for community annoyance, the degree of annoyance at any level depends so highly on factors that are not predictable and not understood that forecasts in particular cases are not feasible. Generally, however, it has been found that below 65 Ldn, noise complaints are sporadic. There are situations where there are no complaints at much higher levels, and situations where there are significant complaints at lower levels.

Part 150 of the Federal Aviation Regulations (1) provides guidance on land uses compatible with various levels of aviation noise. The regulation points out that the responsibility of determining the acceptable and permissible land uses is with the local authority, and that the designations contained in part 150 do not constitute a Federal determination that a use is acceptable or unacceptable under Federal, state or local law. Nevertheless, the guidance contained in Part 150 is based upon the best available scientific knowledge about the effects of noise.

The compatibility standards in Part 150 suggest that any use is compatible with noise below 65 Ldn. Between 65 Ldn and 75 Ldn, houses, apartments, hotels, schools, churches and auditoriums should be built with sound insulation techniques so as to provide the same noise levels inside as are found inside normal construction with an outside level of 65 Ldn. In other words, up to 10 db of extra sound insulation should be provided. Between 65 and 75 Ldn, other uses such as public uses, commercial and manufacturing uses, agriculture and many recreational activities are compatible if buildings in use by the public or occupied as residences have the appropriate extra insulation. Some of these uses are compatible with levels higher than 75 Ldn.

9.42 Assumptions

In view of the preliminary nature of the feasibility study, a number of assumptions have been made in evaluating the potential noise impacts of the proposed expansion for joint use. To assure an understanding of the preliminary nature of this evaluation, the assumptions are discussed.

- o The Air Force traffic does not include projected changes in mission. Therefore the number of military operations remains essentially constant throughout the period 1986 - 2005. However, the types of aircraft change, as follows:
 - + After 1990, the C-9 is replaced by MD-80.
 - + After 1990, the C-140 is replaced by a 2 engine executive jet. For noise purposes, this is assumed to be the equivalent of a Gulfstream III.
- o Air Force activity is primarily on weekdays, with considerably less activity on weekends. For the purpose of calculating noise, the weekday activity has been used as if it were the yearly average. The affect of this is an increase of less than 1.5 db in the Air Force activity contribution to the noise.
- o From the completion of 32R/14L by 1995 until 2005, all military traffic will be on 32L/14R and all civil traffic will be on 32R/14L.
- o All projected air freight activity will occur at night. From the time the new runway becomes available, all projected air freight activity will use the new runway.

- o Traffic other than the night air freight activity will be split evenly between the two runways, starting in 2005. but all military traffic will be on 32L/14R. Consequently, because of the assumption about night freight activity, there will be more total traffic and night traffic on the new runway than on the present runway.
- o Itinerant traffic destinations have been allocated on the basis of present commercial traffic from Lambert.
- o Traffic will arrive and depart on 32 R/L, 75% of the time and on 14 L/R, 25% of the time.
- o Departing traffic on 32L will turn right at 1000 feet if north or east bound; left at 1000 feet, avoiding Shiloh, if south or west bound. Departing traffic on 14R will turn right at 1000 feet if south or west bound. East bound departing traffic on 14 will turn under V44. North bound traffic will continue to turn left for TROY.
- o All night departing freight traffic on 32R will turn right. 747 freight departures will proceed north. Other departures on 32R will be distributed, continuing to turn and climb to reach designated gates.
- o Military traffic performing touch and go will follow a circuit on the southwest side of 14R/32L after the new runway is in operation.
- o Because of the expected location of new terminal facilities and a new runway, helicopters will not use the Silver Creek Route. Therefore all helicopter traffic will be on the River King Route after the new runway is in operation.

- o Instead of incorporating all of the miscellaneous transit military traffic at rare intervals, a single touch and go of an F-4 (two operations) daily has been assumed as a substitute.
- o The operations of Aero Club Cessna 152 and Cessna 172 aircraft have not been included, because the noise from such aircraft is not significant.

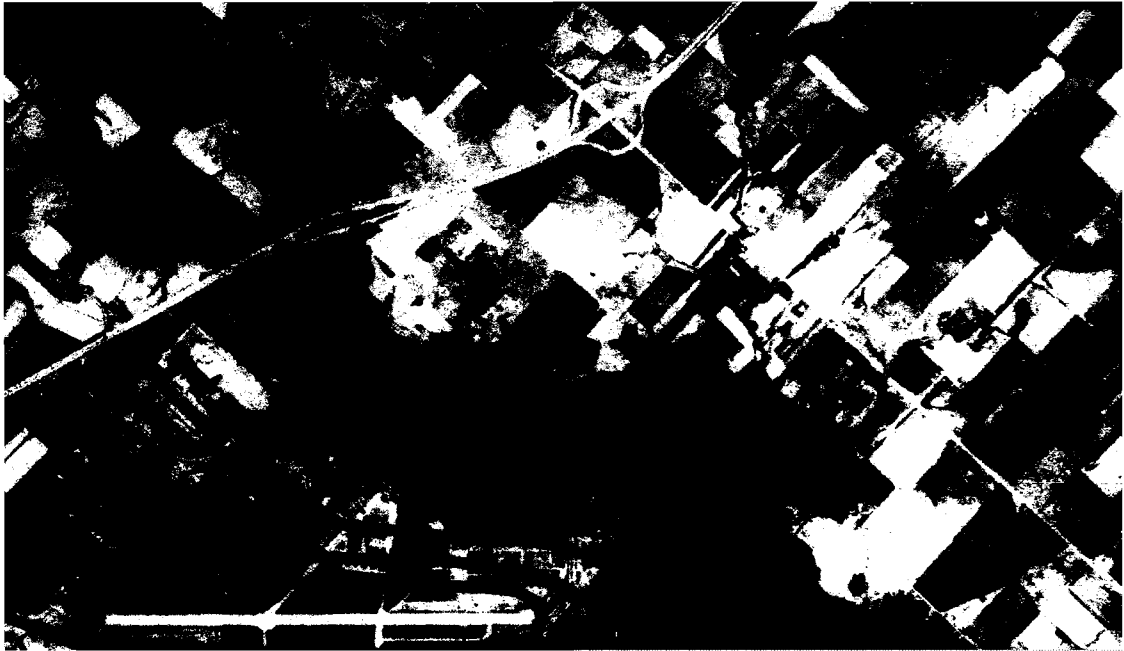
9.43 Noise Contours

Using the forecast activity, and the assumptions stated above, noise contours were calculated for the present traffic (1985), and the traffic forecast for 1990, 1995 and 2005. The resulting contours are shown in Figures 9-1 through 9-4.

Figure 9-1 shows the current noise contours. To the northwest, the 65 Ldn contour does not reach route 158. One farm residence is at the edge of the 65 Ldn contour, and no other residences off base are within the contour. Somewhat less than half of the Wherry housing is subject to noise of 65 Ldn or greater. In the southeast direction, the 65 Ldn contour extend a little more than a mile (about 5600 feet) from the end of the runway, over land that is largely wooded.

Figure 9-2 shows the noise contours in 1990. At this time it was projected that there would be a small amount (12,000 annual operations) of civil traffic, using the existing runway. The northwest 65 Ldn contour now extends about 10,000 feet from the runway end, across Route 158. (To the southeast, the contour extends about 10,000 feet.) Thirty-one farm structures (10 residences) are between the 65 and 70 contours. About half of the Wherry housing is above 65 Ldn, and a small portion is above 70 Ldn. The small increase in operations has such a dramatic effect, areawise, because most of the increase is at night, so the noise

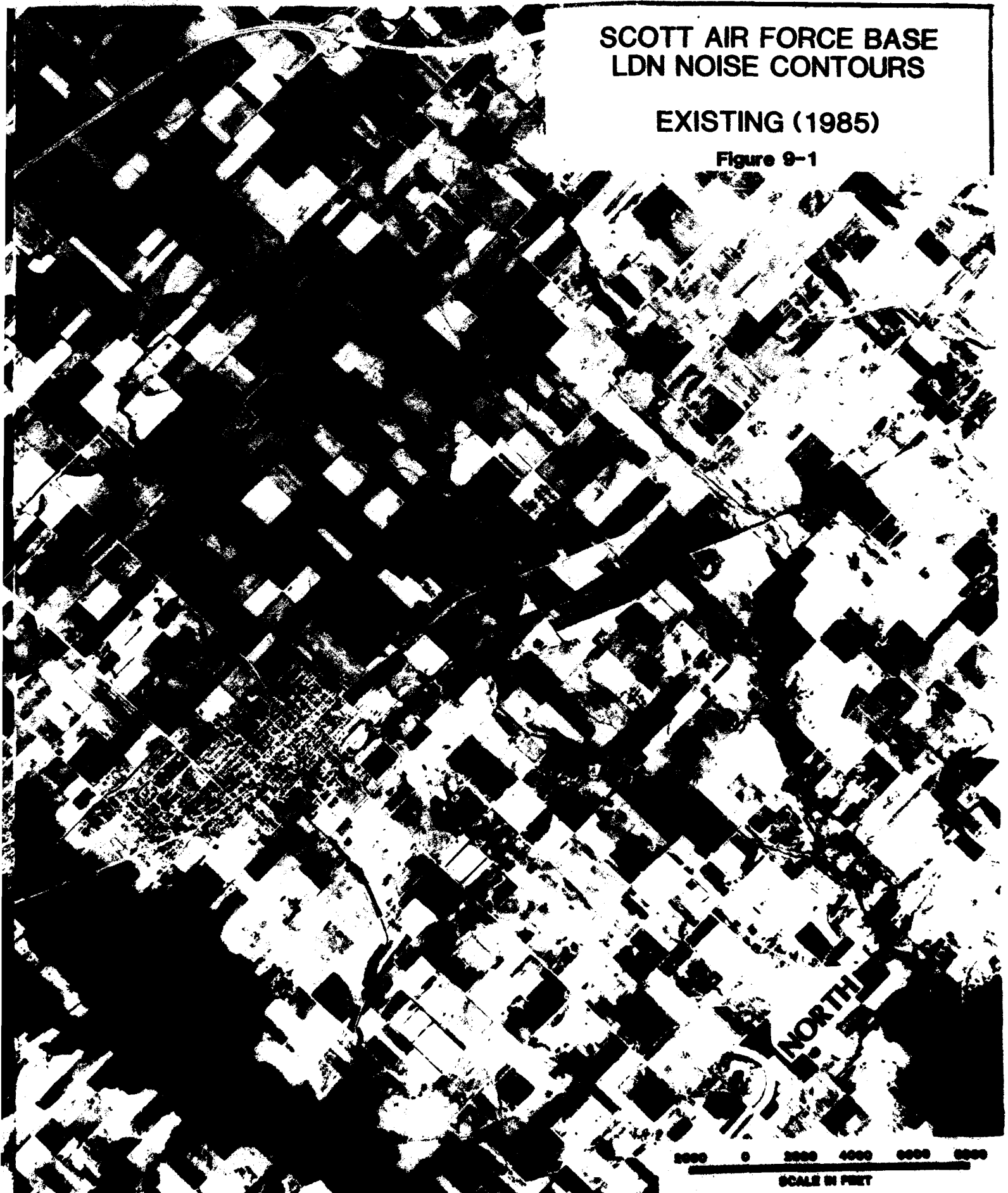




SCOTT AIR FORCE BASE LDN NOISE CONTOURS

EXISTING (1985)

Figure 9-1

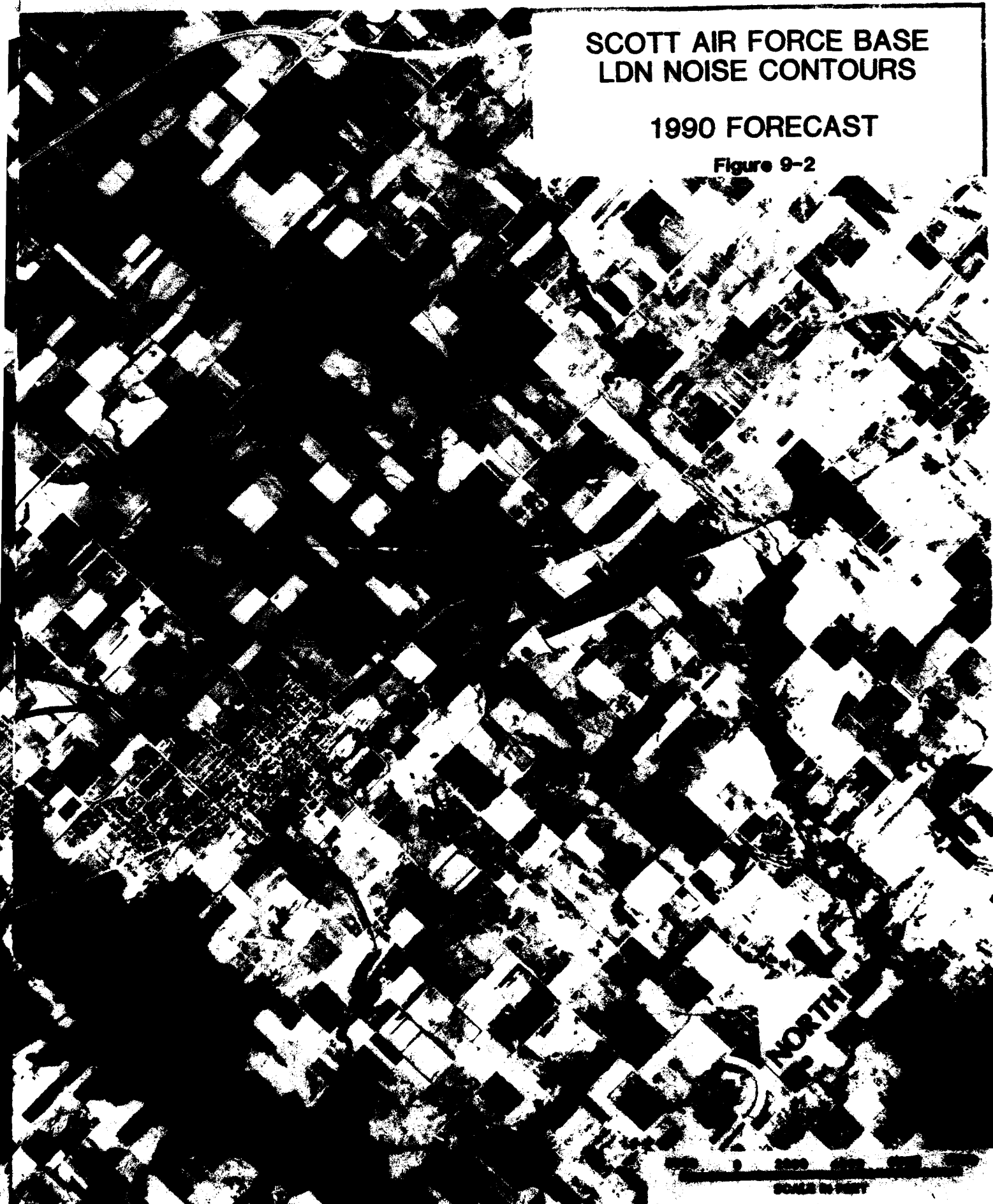




**SCOTT AIR FORCE BASE
LDN NOISE CONTOURS**

1990 FORECAST

Figure 9-2



increase is the equivalent of over 100,000 additional daytime annual operations.

By 1995, a further increase in traffic is projected, to a total of 21,000 annual operations, of which 15,000 are at night. A new runway will be available, which will handle all of the civil traffic. The present runway will revert to only military traffic. Figure 9-3 shows the resulting contours. In size, the contour around the military runway is very close to the present contour. The shape is slightly different because of the change in training operations (touch and go) which are assumed to be on a circuit southwest of the runway instead of northeast. A single farm residence is again on the 65 Ldn contour, and the contour from this runway now includes less than half the Wherry housing. Other residences are outside the contour resulting from operations on the old runway.

On the new runway, the contours are much larger than on the existing runway. Military traffic is virtually non-existent at night, but 71% of the civil traffic is projected to be at night. From a noise standpoint, the civil traffic is the equivalent of over 150,000 annual daytime operations. This new contour extends 17,200 feet from the northwest end of the runway and 19,200 feet southeast of the runway end. Approximately 20 farm residences (62 buildings) and 44 trailer homes are between the 65 and 70 Ldn contour. One retail complex lies in this area. About 5 additional farm residences (18 buildings) are between the 70 and 75 Ldn contours. Two farms and one retail complex lies within the 75 Ldn contour. A small portion of the Wherry housing, on the north, will be at or above noise levels of 65 Ldn, with about 5 homes within the 70 Ldn.



**SCOTT AIR FORCE BASE
LDN NOISE CONTOURS**

**1995 FORECAST
WITH NEW RUNWAY**

Figure 9-3



By 2005, the total annual civil traffic is projected to be over 100,000 operations. Of this, 45% is expected to be at night. About 6,500 of the civil operations are expected to use the military runway. All of the rest will use the new runway. Figure 9-4 shows the resulting contours. The contour around the military runway is not much different from 1985, but the contour around the new runway has expanded to the point that the two 65 Ldn contours join. As a consequence, all of the Wherry housing is above 65 Ldn, and about 25% is above 70 Ldn. The 65 Ldn contour extends 18,000 feet northwest, turning north to a point about 16,000 feet north of the interchange between Interstate 64 and Route 158. In this direction, the 70 Ldn contour reaches U.S. 50 and the 75 Ldn contour crosses the Interstate. To the southeast, the contour extends 26,000 feet, past and north of Mascoutah. The area, although large, is for the most part sparsely populated. It does not touch O'Fallon, Shiloh or Mascoutah.

There are approximately 25 farm residences (71 buildings) between the 65 and 70 Ldn contours; approximately 15 (45 buildings) between 70 and 75 Ldn, and approximately 4 (13 buildings) within the 75 Ldn contour. There are 55 trailer homes between the 65 and 70 Ldn contours as well as 2 retail complexes. One retail complex is between 70 and 75 Ldn and one within 75 Ldn.

Two school buildings located north of the Wherry housing area will be subject to high noise levels. As discussed, Ldn includes a severe penalty on night operations. Because school activities are not generally affected by noise during the hours from 10:00 p.m. until 7:00 a.m., noise was calculated on the basis of day operations only. The results are expressed in terms of Leq. (Ldn is Leq plus 10 db for the hours between 10:00 p.m. and 7:00 a.m. Leq is the constant noise level in dbA which would have the same total energy as the actual noise experienced.) The results, as calculated at the point closest to the extended centerline of the

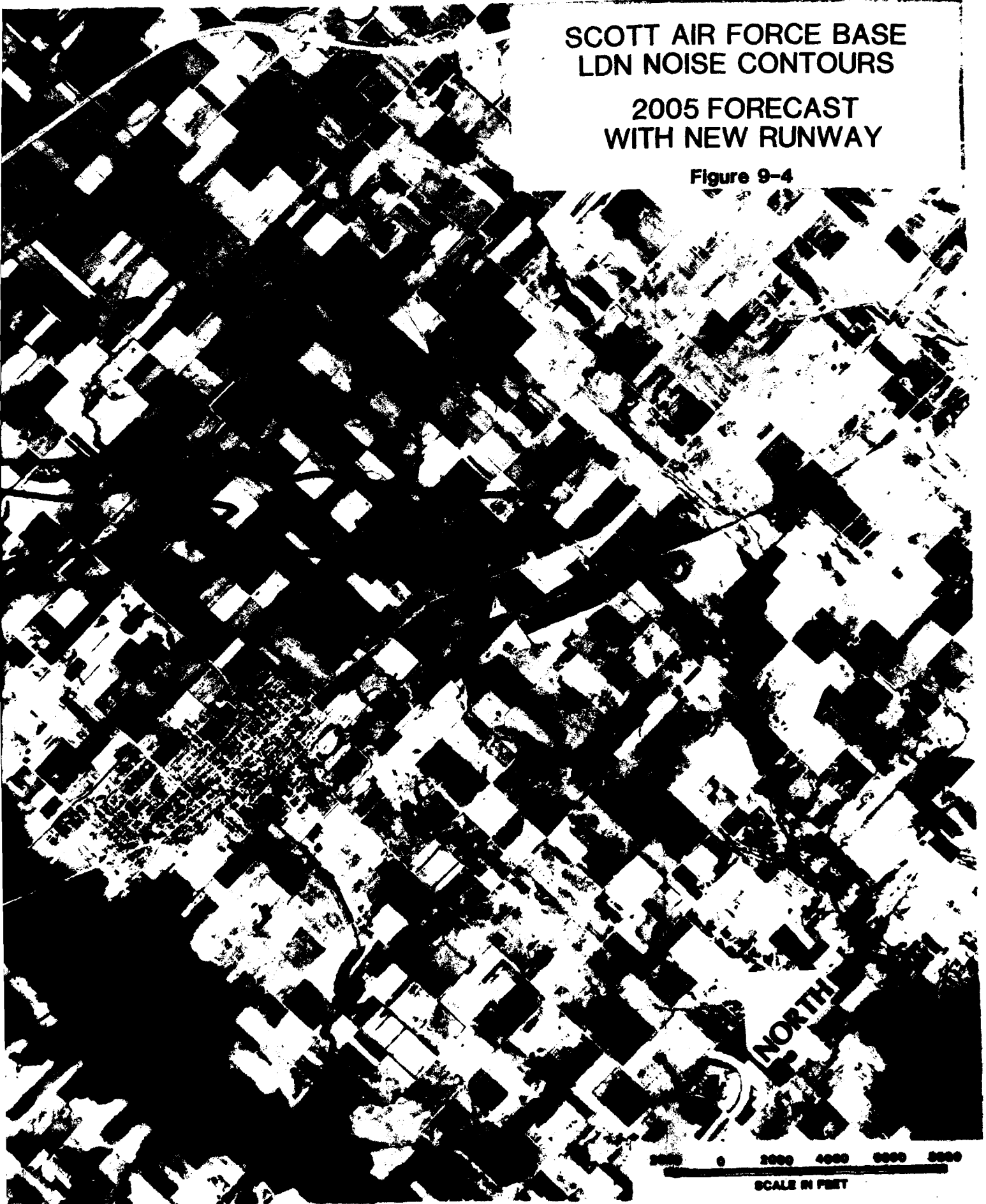




SCOTT AIR FORCE BASE
LDN NOISE CONTOURS

2005 FORECAST
WITH NEW RUNWAY

Figure 9-4



runway are shown in Table 9-1.

<u>School Building</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Northern	67.5	73.6	75.8
Southern	65	71.3	73.5

TABLE 9-1

The levels quoted in the table are, of course, the levels outside the building. The levels inside the building depend upon the structure, and the location of the room within the building. FAA Regulation Part 150, Appendix A, Part B(1) indicates that, generally, schools are compatible with levels below 65 Ldn. Above that level, measures to achieve an outdoor to indoor noise level reduction (NLR) of 25 db for an outdoor noise level of 70 Ldn, and 30 db for an outdoor noise level of 75 Ldn should be instituted. "Normal residential construction can be expected to provide a NLR of 20 db..." These noise level reductions assume mechanical ventilation, and closed windows. With a "normal" NLR of 20 db, the level inside would be 45 Leq if the outside level were 65 Leq.

The question of the effects of these noise levels on a classroom is not a trivial problem. For example, in 1978, results of a study of the effect of reverberation on indoor noise level and speech intelligibility were presented at the Third International Conference on Noise as a Public Health Problem. In essence, because of reverberation, an equivalent apparent noise level is established when someone is speaking. This establishes a "floor", and unless the extraneous noise raises the "floor", it cannot interfere with communication. In a classroom containing 250 cubic meters, (8830 cubic feet, or approximately 10' high, 25' wide and 35' long), a speaker with a level of 59 db(A) at one meter established a "floor" of 45 db(A).

In 1973, and EPA Task Force study included an examination of communication and indoor noise. A level of 45 db(A) "will allow relaxed, face to face conversation with essentially 100% sentence intelligibility for all locations of talker and listener in a typical room". This was based on the assumption that the background noise was more or less constant. If, as with aviation noise, there is considerable fluctuation, then for the same average noise, the background will be lower. The overall intelligibility will depend upon the fraction of the time the noise exceeds the background, and the amount by which the background is exceeded. Depending on the situation, a higher average noise level may be allowable for a given level of intelligibility if the noise is fluctuating. The EPA report discussed the case of calculations based on data from a major airport which demonstrate that an average aircraft noise level of 65 db(A) provided the same 95% sentence intelligibility as 60db(A) of more or less steady noise.

An NLR of 30 db would provide an indoor level of 45 Leq or less with the traffic projected for 2005. This indicates that with extra sound proofing there is a possibility that after 2005, if the projected traffic develops, it might be necessary to provide alternative school facilities. Without additional sound proofing, it is probably (depending upon the performance of the buildings as they exist) that alternative facilities would be necessary sooner.

The above discussion is based on material found in reference 2.

9.44 Mitigation of Noise Impacts

In developing noise mitigation measures, there are three general areas to consider:

- o The role of the noise forecasts.

- o The prevention of non-compatible uses.
- o The mitigation of adverse impacts on current uses.

9.441 Noise Forecasts

The contours, as pointed out earlier, depend on a number of assumptions. The ones discussed earlier are primarily concerned with the way the proposed airfield and the airspace are used. It is apparent that a different set of assumptions could greatly change the impact. There are other assumptions, inherent in the study that also affect the results. Primarily these are concerned with the forecast. Is the traffic growth realistic? If not, is it too slow or too rapid? Is the fleet mix reasonable? How rapidly will existing aircraft become obsolete and be replaced by aircraft that are less noisy? Overall, the sensitivity of the noise forecasts to variations in operations and fleet mix should be considered in developing the mitigation plans to be adopted.

The Boeing 727 has been the world's best selling jet airliner. Although it is no longer in production, it is expected, like the DC-3, to be around a long time. As it is replaced by newer aircraft in passenger service, it is reasonable to assume that it will be used in air freight and package service, but will be replaced by newer and quieter aircraft as time passes. In this study, it was postulated that larger aircraft in the package express fleet would initially be used 727's, but that by 2005, half would be replaced by newer used aircraft, exemplified by the MD-80. To illustrate the effects of this shift, areas within the 65 Ldn contours were compared when the projected fleet composition was changed by changing only aircraft in the mix with a payload of approximately 40,000 pounds.

Noise data are available for five different airframe-engine combinations in the 727-200 series. Table 9-2 shows the relative areas in the 65 Ldn contour with different 727-200's and with the MD-80.

Aircraft/Engine	Relative Area
727-200/JT8D-17	1.00
727-200/JT8D-15	0.97
727-200/JT8D-15QN	0.88
727-200/JT8D-7	0.81
727-200/JT8D-9QN	0.79
MD-80	0.33

TABLE 9-2

This choice is believed to be a reasonable, middle of the road choice. Nevertheless, it is well to proceed cautiously, keep options open, and update forecasts and projected impacts as events develop.

9.442 Prevention of Non-Compatible Uses

It is clear that the major land use incompatibilities are likely to occur after the turn of the century, as the traffic increases. To protect the airport against development which will be incompatible with future traffic, appropriate strategies must be developed. At the very minimum, notice should be given to potential buyers and developers that the area may be subject to aviation noise which is incompatible with certain uses. Of course, one possibility is purchase of all land (where permitted

by law) where uses incompatible with potential future noise might develop. There are some obvious practical considerations which stand in the way. Another possibility is to purchase options on the property which should be protected, so that sale for incompatible uses can be preempted. Another possibility is the purchase of development rights, or other restrictions, which will stand in the way of incompatible development. Land use planning, zoning or other local regulatory action are valuable tools to stabilize the environment around a new airport facility. Private pressures, however, to restructure the land use as land values increase, impinge on the effectiveness of such actions. In moving ahead with the development, careful attention should be given to the cost effectiveness of various measures, and the options selected should be incorporated as an integral part of any regional development plan.

9.443 Mitigation of Adverse Impacts

Finally, consideration should be given to the mitigation of impact on existing incompatible uses. The schools discussed above are a prime example. As the discussion indicates, the start of potential problems is ten years away, and major problems are twenty years away. Of course, action should not be postponed until the problems are major. In the meantime, the remaining useful life of the existing buildings should be determined. If they will be due to be replaced within 10 to 15 years, then perhaps no action need be taken. Modification to achieve a noise reduction level of 35 db would make them usable in the noise environment to perhaps 2010. However, this cost should be compared with the cost of new construction, adequacy of facilities in view of population change and possible building obsolescence. In short, consultation with the school board should be undertaken to determine the best course of action for meeting the mutual goals.

Private dwellings present a different problem. In some cases, noise impacts will be temporary. In other cases, impacts are far off in time. Fortunately, the number of residences potentially affected is relatively small compared to many existing situations. Guaranteed purchase plans can help to overcome the fears of financial loss of present owners. In other cases, noise insulation may be effective. Farm residences are particularly good candidates for insulation, because farming is, in general, a compatible use, and steps to encourage the farms to continue operating help to resolve the overall problem of incompatible uses.

9.5 Conclusions

This limited environmental assessment concludes that the proposed development and operation of Scott AFB as a joint use facility is environmentally feasible. The following specific conclusions can be drawn:

- o Stage 1, or short term, impacts will be minimal.
- o Beyond stage 1, the impacts are more significant and include,
 - (1) Silver Creek wetlands and floodplain impacts due to runway and taxiway construction. Construction and water retention techniques must be employed to mitigate these potential impacts.
 - (2) Archeological investigations will be required to avoid the loss of archeologically significant artifacts.
 - (3) Prime farmland removal will not be substantial. Continued use of much of the acquired farmland for

agriculture may be possible.

- (4) Noise footprints will increase over time with about 45 farms, 55 trailer homes, 2 schools and base housing exposed to noise levels considered significant (above 65 Ldn).

Measures are necessary to minimize these impacts. A range of measures should be investigated, including soundproofing, compensation, property or easement acquisition.

- (1) 14 CFR Part 150

- (2) FAA-EE-84-18, Land Use Compatibility Study: Aircraft Noise and Land Use, June 1984

Bibliography

- Center for Urban and Environmental Research and Services.
1980. 1980 Illinois Local Area Profiles St. Clair
County and Its Municipalities. (Census Data) Edwardsville,
Illinois.
- Federal Emergency Management Agency. Floodway Data, Silver
Creek. St. Clair County, Illinois.
- Harland & Bartholomew & Associates, Inc. December, 1985.
Scott Air Force Base Comprehensive Plan. St. Louis,
Missouri.
- Illinois Department of Conservation Division of Fish and
Wildlife Resources. 1979. What Fish Is This?.
Springfield, Illinois.
- Illinois Department of Conservation Division of Fish and
Wildlife Resources. 1983. Aquatic Weeds Their
Identification and Methods of Control. Springfield,
Illinois.
- Illinois Environmental Protection Agency. June 1985.
Illinois Annual Air Quality Report, 1984. Springfield,
Illinois.
- Illinois Environmental Protection Agency. June, 1981.
Protecting Illinois Waters. Illinois.
- Illinois Environmental Protection Agency. 1980-1981.
Illinois Water Quality Inventory Report 1980-1981.
Springfield, Illinois.
- St. Clair county Board of Supervisors. December, 1969.
St. Clair County, Illinois Zoning Ordinance. St.
Clair, Illinois.
- Southwestern Illinois Metropolitan and Regional Planning
Commision. April, 1978. Volume I Environmental
Inventory. Collinsville, Illinois.
- Southwestern Illinois Metropolitan and Regional Planning
Commission. April, 1978. 208 Water Quality Management
Regional Atlas. Collinsville, Illinois.
- Southwestern Illinois Metropolitan Area Planning Commission.
February, 1973. Open Space and Historic Site
Preservation Study.

Section 10 Economic Impacts

10.1 Background

Major investments in transportation infrastructure projects, like the joint use facilities at Scott AFB yield a wide range of benefits. Some of these benefits can be measured directly, while others are much less immediate. This section provides an approach for measuring and quantifying these benefits.

The study breaks the benefits into three basic categories:

1. Specific economic benefits
 - job creation
 - income
 - reduced unemployment benefits payments
 - increased tax revenues
2. Time and cost savings to the public
3. Enhanced regional development opportunities

The approach used to calculate benefits follows standard methodology, using estimates of direct and induced job creation as well as time savings to the public. The report also discusses the broader regional growth opportunities that could be stimulated by joint use facilities at Scott AFB. This latter consideration is particularly important because the regional benefits from relieving congestion at Lambert can result in an improved transportation infrastructure in Southern Illinois and in enhanced employment opportunities for the region.

Overall, as a result of construction and operations at Scott AFB through 2005, local income is projected to increase by \$810 million, State and local unemployment expenditures to

decline by \$33 million, tax revenues to increase by \$40 million, and travelers to realize \$85 million in time saved and costs reduced because of access to a closer airport. These benefits are summarized in Table 10-1.

10.2 Employment and Payroll Benefits

One of the most important economic benefits of joint use facilities at Scott AFB, is the creation of jobs and the subsequent reduction in unemployment. To determine the employment and payroll potential for the joint use proposal, direct, induced and indirect employment was considered.

Direct employment results from economic activities conducted at the airport by airlines, fixed base operators, and tenants. Employment and the purchase of locally-produced goods and services, including contracting for airport construction and capital improvements, all directly generate jobs. Since a large construction program is central to the Scott AFB proposal, employment figures for construction are shown separately.

Induced employment reflects the "multiplier" effect of the additional spending by those directly employed at the airport. By way of explanation, much of an airport employee's take-home salary becomes income to other local individuals who provide goods and services to the airport employee, thereby creating additional employment opportunities.

Indirect employment results from off-airport economic activities which are attributable but not directly related to the airport. These include retail establishments on or near airport access routes, such as filling stations, as well as other services, such as travel agencies, hotels, and restaurants. These enterprises also provide employment, purchase locally produced goods and services. The larger

Table 10-1
Overall Benefits
(\$ in millions)

	Increase Regional Income	Savings in Unemployment Payments	Increased State and Local Taxes	Savings in Time Travel Costs
*1988	\$19.6	\$ 0.8	\$ 1.4	0.0
*1989	19.6	0.8	1.4	0.0
1990	7.0	0.3	0.3	0.5
1991	8.9	0.4	0.4	0.6
1992	10.9	0.5	0.4	0.8
*1993	52.2	2.1	3.6	1.0
*1994	54.2	2.2	3.6	1.2
1995	16.8	0.7	0.7	1.7
1996	22.2	0.9	0.9	2.3
1997	27.6	1.2	1.1	3.0
*1998	55.3	2.2	3.3	4.0
*1999	60.7	2.4	3.5	5.2
2000	51.4	2.1	2.1	7.4
2001	61.0	2.6	2.6	8.5
2002	70.6	3.0	3.0	9.7
*2003	93.3	3.9	4.1	11.0
*2004	102.9	4.3	4.5	12.5
2005	99.3	4.2	4.0	15.5
	<u>\$833.5</u>	<u>\$34.6</u>	<u>\$40.9</u>	<u>\$84.9</u>

* years in which construction occurs

the volume of customers at or near the airport, the larger the draw for indirect category establishments. For Scott AFB, therefore, indirect impacts would be minimal until the latter 1990's, and have not been estimated in this report.

For airports with fewer than 4 million total annual passengers, some basic employment and payroll planning guidelines have been derived by analyzing existing airports. The planning guidelines are applied to "total annual passengers" (Total annual passengers roughly equal enplaned passengers times two; they include originating, terminating, transit, and transfer passengers who impose a workload on the local airport facilities or employees.) Typical planning guidelines would be:^{1/}

- (1) There are approximately 7.7 direct employees for every 10,000 total annual passengers. The worst case is 6.2 and best case is 9.2
- (2) The salary of a typical employee at a relatively low activity airport is \$22,000 per year
- (3) One additional airport employee is added for every 7 airport based general aviation aircraft
- (4) Labor represents 40 percent of construction costs
- (5) Construction payroll is approximately \$24,000 per employee
- (6) Induced employment multipliers typically average about 1.0.

^{1/} See, for example, "Measuring the Regional Economic Significance of Airports" by Stewart E. Butler and Lawrence J. Kiernan, National Planning Division, Federal Aviation Administration (January 1986).

Estimates of employment and payroll were obtained by applying the above guidelines (except that a slightly lower induced employment multiplier of 0.75 was used because the immediate surrounding area is relatively rural and has a high regional import component) to the forecast traffic levels and construction costs. The results are shown at Tables 10-2 and 10-3.

Capital investment at Scott AFB should generate significant economic benefits. Construction would create 10,500 man years of employment (direct and induced) between 1988 and 2005 and would result in payrolls of over \$250 million. In addition an estimated \$180 million would be spent on construction material.

By 2005 airport operations at Scott AFB for passenger and general aviation activity are projected to produce annually over 3,500 jobs (direct and induced) with an annual payroll of approximately \$78 million. Air cargo and small package express activities could add an additional 2,500 jobs and \$54 million in annual payroll. Therefore, the combined airport passenger, cargo and general aviation operations could result in over 6,000 jobs (direct and induced), and over \$132 million in annual payrolls. See Table 10-4.

Some of the jobs will be filled by out-of-state residents and other area residents will find alternative employment in the absence of opportunities at Scott. Thus for planning purposes, the study assumes that 75 percent of the jobs represent net additional employment and income to the region. The 75 percent rate is high, but reasonable in view of the high unemployment rate in the five country area.

Table 10-2

Scott AFB Joint Use Proposal
Potential Economic Impact

Year	Direct and Induced Construction Employment	Total Payroll as a Result of Construction (\$ million)	Direct and Induced Airport Operations Employment	Total Payroll as a Result of Operations (\$ million)	Combined Employment Construction & Operations	Combined Payroll (\$ million)	Construction Material	Potential Impact (\$ million)
1988	(625)	\$ 26.2			1093	\$ 26.2	\$ 18.8	\$ 45.0
1989	(625)	\$ 26.2			1093	\$ 26.2	\$ 18.8	\$ 45.0
1990			(241)	\$ 9.3	422	\$ 9.3		\$ 9.3
1991			(309)	\$ 11.9	541	\$ 11.9		\$ 11.9
1992			(377)	\$ 14.5	660	\$ 14.5		\$ 14.5
1993	(1250)	\$ 52.5	(445)	\$ 17.1	2967	\$ 69.6	\$ 37.5	\$ 107.1
1994	(1250)	\$ 52.5	(513)	\$ 19.8	3086	\$ 72.3	\$ 37.5	\$ 109.8
1995			(581)	\$ 22.4	1017	\$ 22.4		\$ 22.4
1996			(768)	\$ 29.6	1344	\$ 29.6		\$ 29.6
1997			(955)	\$ 36.8	1671	\$ 36.8		\$ 36.8
1998	(709)	\$ 29.8	(1141)	\$ 43.9	3237	\$ 73.7	\$ 21.3	\$ 95.0
1999	(709)	\$ 29.8	(1328)	\$ 51.1	3564	\$ 80.9	\$ 21.3	\$ 102.2
2000			(1780)	\$ 68.5	3115	\$ 68.5		\$ 68.5
2001			(2112)	\$ 81.3	3696	\$ 81.3		\$ 81.3
2002			(2444)	\$ 94.1	4277	\$ 94.1		\$ 94.1
2003	(417)	\$ 17.5	(2776)	\$ 106.9	5588	\$ 124.4	\$ 12.5	\$ 136.9
2004	(417)	\$ 17.5	(3108)	\$ 119.7	6169	\$ 137.2	\$ 12.5	\$ 149.7
2005			(3440)	\$ 132.4	6020	\$ 132.4		\$ 132.4
	(6004) 4502 man years	\$252.0	(22,318) 16,740 man years	\$859.3	49,560 man years	\$1,111.3	\$180.2	\$1,291.5

() are direct employment

Note: For local impact, reduce employees and payroll by 25 percent and material by 50 percent.

Table 10-3

Reduction in Southwest Illinois Unemployment

<u>Year</u>	<u>Jobs Created</u>	<u>Jobs Filled by Local Labor</u>	<u>% of Local Labor Force</u>	<u>% Unemployment Rate & Reduction</u>	
1985	0	0	0	9.4	(0)
1988*	1093	820	0.3	9.1	(-.3)
1989*	1093	820	0.3	9.1	(-.3)
1990	422	317	0.1	9.3	(-.1)
1991	541	406	0.1	9.2	(-.2)
1992	660	495	0.2	9.2	(-.2)
1993*	2967	2225	0.8	8.6	(-.8)
1994*	3086	2315	0.8	8.6	(-.8)
1995	1017	763	0.2	9.2	(-.2)
1996	1344	1008	0.3	9.0	(-.4)
1997	1671	1253	0.4	8.9	(-.5)
1998*	3237	2428	0.8	8.5	(-.9)
1999*	3564	2673	0.9	8.4	(-1.0)
2000	3115	2336	0.8	8.6	(-0.8)
2001	3696	2772	0.9	8.4	(-1.0)
2002	4277	3170	1.1	8.3	(-1.1)
2003*	5588	4191	1.4	7.9	(-1.5)
2004*	6169	4626	1.6	7.8	(-1.6)
2005	6020	4515	1.5	7.9	(-1.5)

*Construction years

Between 1988 and 2005, cumulative construction and airport operations employment and payroll figures totaled over 48,000 man years of employment and almost \$1.1 billion in payroll. Assuming that 75 of the payroll represents net additional income to in the region, the study projects five county benefits of over \$800 million in payroll and 36,000 man years of employment.

Table 10-4
Scott AFB Joint Use
Approximate Impacts for Various Development Phases
(all figures rounded)
Passenger and General Aviation

Range of employees /10,000 pax	Year	Based Aircraft	Annual Passengers	Direct Impact			Induced Impact		Direct plus Induced Impact
				Estimated Employment	Payroll per Employee	Total Payroll	Employment	Income	
Lower 6.2	1990	0	121,000	70	\$22,000	\$1,540,000	53	\$1,166,000	123 \$2,706,000
	1995	3	381,000	220 (1)	22,000	\$4,840,000	165	\$3,630,000	385 \$8,470,000
	2000	53	1,464,000	851 (7)	22,000	\$18,722,000	638	\$14,036,000	1489 \$32,758,000
	2005	100	2,810,000	1634 (14)	22,000	\$35,948,000	1226	\$26,972,000	2860 \$62,920,000
Middle 7.7	1990	0	121,000	86	\$22,000	\$1,892,000	65	\$1,430,000	151 \$3,332,000
	1995	3	381,000	273 (1)	22,000	\$6,006,000	205	\$4,510,000	478 \$10,516,000
	2000	53	1,464,000	1055 (7)	22,000	\$23,210,000	791	\$17,402,000	1846 \$40,612,000
	2005	100	2,810,000	2025 (14)	22,000	\$44,550,000	1519	\$33,418,000	3544 \$77,968,000
Upper 9.2	1990	0	121,000	103	\$22,000	\$2,266,000	77	\$1,694,000	180 \$3,960,000
	1995	3	381,000	327 (1)	22,000	\$7,194,000	245	\$5,390,000	572 \$12,584,000
	2000	53	1,464,000	1260 (7)	22,000	\$27,720,000	945	\$20,790,000	2205 \$48,510,000
	2005	100	2,810,000	2418 (14)	22,000	\$53,196,000	1814	\$39,908,000	4232 \$93,104,000

Notes:

Total annual passenger equal enplaned passengers X 2

Estimated employment does not include air traffic control. Airport management is reduced by 25 percent due to joint use conditions.

Figures in () are the included general aviation additive.

Table 10-4 (cont'd)
AIRCARGO AND SMALL PACKAGE EXPRESS ADDITIVES

Year	<u>Direct Impact</u>			<u>Induced Impact</u>			<u>Direct Plus Induced Impact</u>		
	<u>Estimated Employment</u>	<u>Payroll per Employee</u>	<u>Total Payroll</u>	<u>Employment</u>	<u>Income</u>	<u>Employment</u>	<u>Income</u>	<u>Employment</u>	<u>Income</u>
1990	155	\$22,000	\$3,410,000	116	\$2,552,000	271	\$5,962,000		
1995	308	\$22,000	\$6,776,000	231	\$5,082,000	539	\$11,858,000		
2000	725	\$22,000	\$15,950,000	544	\$11,962,500	1269	\$27,912,500		
2005	1,415	\$22,000	\$31,130,000	1,061	\$23,342,000	2,476	\$54,472,000		

(Adding the middle (7.7) range of employees to annual passengers would bring the combined potential airport employment/income figures to:)

COMBINED PASSENGER/CARGO

Year	<u>Direct Impact</u>			<u>Induced Impact</u>			<u>Direct Plus Induced Impact</u>		
	<u>Estimated Employment</u>	<u>Payroll per Employee</u>	<u>Total Payroll</u>	<u>Employment</u>	<u>Income</u>	<u>Employment</u>	<u>Income</u>	<u>Employment</u>	<u>Income</u>
1990	241	\$22,000	\$5,302,000	181	\$3,982,000	422	\$9,284,000		
1995	581	\$22,000	\$12,782,000	436	\$9,592,000	1,017	\$22,374,000		
2000	1,780	\$22,000	\$39,160,000	1,335	\$29,370,000	3,115	\$68,530,000		
2005	3,440	\$22,000	\$75,680,000	2,580	\$56,760,000	6,020	\$132,440,000		

10.3 Reductions in Unemployment Payments

Statistics from the Illinois Department of Employment Security indicate an August 1985 unemployment figure of 27,900 persons in Clinton, Jersey, Madison, Monroe and St. Clair Counties. As of January 31, 1986, St. Clair County alone had approximately 12,620 unemployed, a civilian unemployment rate of 9.3 percent. The unemployment figure for East St. Louis was 10.5 percent and Belleville 13.2 percent for the same period of time. Even these high rates do not show the total unemployment situation since an individual must be actively seeking employment in order to be classified as unemployed; in high unemployment areas such as Southwestern Illinois, many workers become typically discouraged and drop out of the labor force to subsist on welfare or other sources of income.

The January 1986 St. Clair County unemployment benefit data (average unemployment benefit of \$135 per month) was used as a baseline to estimate the savings from job creation on unemployment benefits. Assuming a \$135 per month benefit throughout the five county area, present unemployment benefits total approximately \$3.2 million per month or \$39 million per year. For the year 2005, (assuming 75 percent of the jobs created are filled by local labor), Scott AFB employment would reduce the requirement for unemployment benefits by over \$4.0 million per year.

10.4 Increase in the Tax Base

The tax revenues derived from increased employment and the sale of construction materials for the Scott AFB development are shown at Table 10-5.

The calculations are based on information provided by officials in the Illinois Department of Revenue, the St. Clair County Assessor's Office and the Internal Revenue Service. The tax rates used in the calculations are: state income tax of 2.5 percent, state sales tax of 5.0 percent, and county sales of 1.5 percent. The sales tax base was derived from the Internal Revenue Service allowance for Illinois residents with a \$20,000 salary and two dependents.

The tax revenue calculations also assume that 75 percent of the jobs created will be additional to the local labor force and will generate new tax revenues; the remaining employment will result from out-of-state labor or workers who would otherwise have been employed. It is further assumed that 50 percent of the materials will be purchased from the surrounding five county areas.

The increase of property tax revenues is much more difficult to forecast, primarily because significant property tax increases result from the growth of "indirect" businesses (e.g. restaurants, hotels, gasoline stations) supporting the airport. Because the study has not attempted to quantify the growth of indirect business and employment, no effort has been made to estimate their effects on property taxes. In addition, no estimate has been made of the tax benefits resulting from the upgrading of property or new residential construction.

Property tax figures are based on data derived from the St. Clair County Assessor's Office. Productive farm land near Scott is assessed on the basis of approximately \$75 per acre production. Developed land is assessed at \$5,000 per acre. The tax rate approximates to \$5 per \$100 assessed value. As a result of these omissions, the revenue forecasts on Table 10-5 understate the potential tax benefits accruing to the development of Scott AFB as a joint use facility.

Table 10-5

**Increases in Annual
Tax Revenues
(1984 \$ million)**

	State Income Tax	State Sales Tax	County Sales Tax	Property Tax
1987	\$0.0	\$ 0.0	0.000	0.006
1988*	0.5	0.7	0.197	0.004
1989*	0.5	0.7	0.197	0.004
1990	0.2	0.1	0.019	0.004
1991	0.2	0.1	0.024	0.004
1992	0.3	0.1	0.029	0.004
1993*	1.3	1.8	0.463	0.038
1994*	1.4	1.8	0.467	0.038
1995	0.4	0.2	0.044	0.041
1996	0.6	0.3	0.059	0.041
1997	0.7	0.3	0.073	0.041
1998*	1.4	1.6	0.191	0.079
1999*	1.6	1.7	0.203	0.079
2000	1.1	0.5	0.113	0.079
2001	1.4	0.7	0.143	0.079
2002	1.7	0.9	0.195	0.079
2003*	2.3	1.4	0.314	0.118
2004*	2.5	1.1	0.320	0.118
2005	<u>2.5</u>	<u>1.2</u>	<u>0.251</u>	<u>0.118</u>
	\$20.5	\$15.3	\$3.302	\$0.974

*Construction years.

10.6 Time and Travel Savings

One of the major benefits of developing a new airport is the travel time saved and costs avoided by using more convenient facilities. Furthermore, in the case of a potential reliever airport such as Scott AFB, reductions in delays at the prime airport (i.e. Lambert) also offer significant benefits, although this study has not attempted to quantify these latter benefits.

10.61 Proximity Benefits

In the case of time saved and costs reduced for travelers using civilian facilities at Scott AFB, the study has calculated the savings with relation to Lambert. The results of these calculations are summarized in Table 10-1. The key assumptions are that travelers using Scott save an average of 10 miles in 1990 (growing to 13 miles by 2005), that there is an equal amount of business and non-business travel and that the average value of time saved is \$17.50 per hour for business, and \$5.00 per hour for non-business travel.

Development of Scott AFB as a joint facility would therefore offer significant savings to the traveling public in Southwest Illinois, including residents of Scott AFB. In addition, such time saving benefits are likely to play an important role in attracting new industries to the local area.

10.62 Reduced Aircraft Delay Benefits

Studies conducted by the FAA in the early 1980's indicate that the average delay per aircraft operation, system wide, was 5.9 minutes, with an associated delay costs ranging from \$1,200 to \$2,400 per hour, depending upon whether the value of the passengers' time is included. The FAA further estimated that

by 1991, the annual delay costs to the airlines would reach \$2.7 billion (1980 dollars), excluding passengers' time, and the average delay time would be 8.7 minutes. Because airlines pass along higher costs, travellers pay for these delays in the system.

In 1982, Lambert had a mean delay of 5 minutes per operation; by 1985, the average delay had grown to 6 minutes. This amounts to 41,129 hours of delay time per year with costs to the public ranging from \$49 million to \$99 million. Aircraft delays increase exponentially as traffic is added to a congested airport. Use of Scott AFB to absorb Lambert's unsatisfied demand in the future will help control the delay rate in the St. Louis area and will save the airlines, and in turn, the traveling public, a great deal of time and money. The study team did not attempt to make quantitative assessment of these potentially important savings, but believes they would be substantial.

10.7 Broader Economic Benefits

In addition to those benefits which are directly related to the construction, operation, and time and cost savings associated with Scott AFB, the study team also identified broader economic benefits.

Development of Scott AFB should improve the region's overall growth prospects in two major ways. First, it will relieve capacity constraints at Lambert that will increasingly limit the potential for development in the region. Second, Scott AFB has a much greater potential for serving as an all-cargo or small package express hubbing operation. Based on the growth of just-in-time manufacturing, tighter inventory management and overseas sourcing, Scott AFB could provide the

anchor for the growth of industrial parks and distribution centers. These in turn would stimulate further economic development. See Appendix 10.1 for further detail.

Moreover, the study team believes that the availability of this type of improved distribution capacity will become increasingly important in the future. For example, regional economic development agencies already emphasize transportation advantages in their promotional materials and analyses. A joint use facility at Scott should give Illinois and the St. Louis region an additional selling point in attracting firms that will offer employment opportunities to local citizens.

Because the linkages between Scott AFB and these broader economic benefits are difficult to predict, no effort has been made to quantify them. As an example, however, the impact of Dulles Airport in stimulating economic development in the Washington-Dulles corridor suggests that these impacts could be substantial.

10.8 Conclusions

- o The development of Scott AFB as a joint use facility promises substantial economic benefits to the St. Louis/Southern Illinois region.
- o By far the most important economic benefit is the creation of employment and increased income to residents of the region (over 49,000 man years of employment through 2005 with a cumulative payroll of over \$860 million.)
- o Increased revenues from the sales and income taxes and reductions in unemployment compensation are also significant (\$75 million cumulative through 2005.)

- o The property tax benefits are not projected to be significant principally because of the conservative estimate that only sixty acres of industrial park would be developed by 2005 and the fact that no indirect business development was forecast. In reality the property tax benefits, therefore, are likely to be higher, but the study team had no reliable basis for estimating them.
- o Savings in travel time and cost -- principally to residents of southwestern Illinois -- will also be significant (\$ 85 million cumulative through 2005). Reductions in delays at Lambert will provide significant benefits to airlines and travelers serving Lambert.
- o Property tax revenues will adjust from approximately \$3.75 per acre, to \$250 per acre for each acre developed for the purpose of private business. Facility construction will add even more revenues, based on assessed value.
- o Finally, development of Scott AFB as part of improved air transport infrastructure should provide a sizeable boost to overall growth prospects for the region.

Section 11 Airport Sponsorship

11.1 Introduction

Public airports in the United States and the State of Illinois are owned and operated under a variety of organizational and jurisdictional arrangements. This is also true of sponsors for joint use of military airfields. In the latter case, the only requirement is that the sponsor be a "local government agency eligible to sponsor a public airport"^{1/} Usually, ownership and operational authority coincide; however, in some cases airports are owned by a city, county or the State (or a combination thereof), but operated by a separate public body. The separate public body can be either a commission or authority specifically established for the purpose of managing the airport. Regardless of ownership, the legal responsibility for airport operations and management can be granted to several kinds of public or governmental entities:

- o Municipal government
- o County government
- o Multipurpose port authority
- o Airport authority
- o State government
- o Park district or other agencies
- o Federal government

Nationwide, more than half of the large and medium public commercial use airports are operated by municipal or county governments. In the small commercial airport category, this percentage increases to 61 percent. (See Table 11-1).

^{1/}Secretary of Defense Memorandum, December 16, 1983

Table 11-1
Public Operation of Commercial Airports By Size, 1983

Airport Operator	Large		Medium		Small	
	No.	%	No.	%	No.	%
Municipality or county	14	58	23	49	N/A	61
Port authority	5	21	6	13	N/A	3
Airport authority	3	13	12	26	N/A	31
State	1	4	5	11	N/A	5
Federal Government	<u>1</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>N/A</u>	<u>0</u>
TOTAL	24	100	47	100	489	100

Notes: N/A = Not available

Source: Airport Systems Development, Office of Technology Assessments.

The municipally operated airport is typically city owned and managed as a department of the city with policy guidance from the city council. In some cases a separate airport commission or advisory board is established to provide the policy guidance. County run airports tend to follow the same organization.

While this may be the most common form of management organization, it does not necessarily provide for the dynamic management required in today's competitive commercial airport environment.

City and county airports usually rely on two forms of tax exempt municipal bonding to raise investment capital:

- 1) general obligation bonds, backed by the full faith, credit

and tax power of the issuing governments; 2) revenue bonds, which require airport generated revenues to cover the debt service.

Other commercial airports are run by multi-purpose port authorities. These are legally chartered institutions with public corporation status that operate a variety of publicly owned facilities such as toll roads, harbors, tunnels, airports and bridges. Port authorities have a great deal of independence from state and local governments in their conduct of day-to-day business, and can therefore provide the flexible management required. Much of this independence stems from the power to issue their own debt in the form of revenue bonds, their broad toll or fee revenue base, and limited (but rarely used tax) authority.

A more restricted management structure is the airport or aviation authority. These single purpose institutions are similar in structure and legal status to the multipurpose authority, except that they have a much narrower base of revenues to draw upon. These single purpose authorities also have considerable independence, hence flexibility, from the state or local government which may retain ownership of the airport.

State and federally owned airports do exist but are relatively few in number. State-run airports are usually managed by the State's department of transportation. Alaska, Connecticut, Hawaii, Illinois and Maryland currently have state run airports. The U.S. Department of Transportation's operation of Dulles and Washington National by the Federal Aviation Administration is a subject of continual review and debate. In addition the U.S. government owns and operates Pomona (Atlantic City, New Jersey) Airport which is the FAA Technical Center.

11.2 Current Illinois Airports

Seven methods of airport administration exist in the State of Illinois. These are:

Figure 11-1 Illinois Airport Owners Directory

Airport Authority Administrated Airports (28)

Alton	Marion
Bloomington	Mattoon
Cairo	Mt. Vernon
Carbondale	Moline
Danville	Olney
Flora	Peoria-Greater Peoria
Greenville	Peoria-Mt. Hawley
Harrisburg	Robinson
Jacksonville	Rockford
Kankakee	Salem
Kewanee	Savanna
Lawrenceville	Sparta
Litchfield	Springfield
Macomb	West Chicago

City-Owned Airports (27)

Aurora	Lansing
Benton	Metropolis
Carmi	Monmouth
Casey	Morris
Centralia	Mt. Carmel
Chicago-Meigs	Perkin
Chicago-Midway	Peru-Illinois Valley
Chicago-O'Hare	Pinckneyville
DeKalb	Pittsfield
Dixon	Pontiac
Fairfield	Quincy
Freeport	Rochelle
Galesburg	Taylorville
Hillsboro	

County-Owned Airports (7)

Aledo	Paris
Effingham	Shelbyville
Lacon	Sterling
Lincoln	

Park District Administrated Airports (5)

Beardstown	Joilet
Canton	Vandalia
Decatur	

State-Owned Airports (1)

Champaign

Agency Administrated Airports (1)

East St. Louis

Port District Administrated Airports (2)

Havana	Waukegan
	Total 71

11.3 Existing Illinois Statutes

The laws of the State of Illinois as outlined in the Illinois Aeronautics Act, Airport Zoning Act, Municipal Airport Authorities, Airports and Landing Field, County Airports Act, and Joint County-City Airports sections of Aeronautics and Other Related Laws of Illinois, provide the general regulatory guidance for airports sponsorship. Operative portions of the laws are listed below:

**Figure 11-2
Municipal Airport Authorities**

- 68.1. Definitions
- 68.2. Creation of an Airport Authority
 - 68.2a. Petition - Setting for Public Hearing and Notice Thereof
 - 68.2e. Where Territory in More Than One County
- 68.3 Board of Commissioners
 - 68.3a. Board of Commissioners - Appointment

Airports and Landing Fields

- 69. Airports and Landing Fields - Power of Counties
- 70. Acquisition of Property or Rights - Appropriations
- Taxes - Borrowing money - Bonds on Credit of
County

Counties of Less than 1,000,000

- 86. Directors - Appointment
- 89. Directors - Election of Officers - Rules and
Regulations - Powers and Duties

County Airports Act

- 104. Definitions
- 105. Commission Defined
- 106. Joint Commission Defined
- 107. Commissioner Defined
- 108. Superintendent Defined
- 109. Aircraft Defined
- 110. Airport Defined
- 111. Department Defined
- 112. Airport Facilities Defined
- 122. Acquisition and Operation of Airport or System of
Airports - Power of County
- 123. County Board - Powers and Duties - Roll Call Vote
- 124. County Airports Commission - Powers and Duties
- 125. Location, Establishment and Operation of Airport
or System of Airports
- 132. County Superintendent of Airports - Power to
Appoint
- 134. Supervision and Custody of Airports
- 139. County Superintendent of Airports - Provision For

- 140. County Superintendent of Airports - Qualifications -Competitive Examination
- 172. Joinder of Counties - Petition
- 173. Joinder of Counties - Election of Commissioners - Membership of Commission - Organization - Powers and Duties
- 174. County Superintendent of Airports - Joinder of Counties - Appointment - Resolutions of Joint Commission Respecting Taxes, etc. Clerk of Joint Commission

Joint County-City Airports

- 601. Joint Establishment and Operation of Airports
- 602. Joint County-City Airport Commission
- 603. Tort Immunity - Airport Employees
- 604. Powers and Duties of Commission
- 605. Intergovernmental Agreements
- 606. Park Districts - Contents and Termination of Agreements - Commission's Powers and Duties

11.4 Statute Provisions

The following is compiled from a review of the Aeronautics and Other Related Laws of Illinois, 1982 Edition, and a February 3, 1986 document Potential Forms of Airport Sponsorship Under the Illinois Revised Statutes provided by IDOT.

***** Begin Compilation and Extract *****

State sponsorship - page 81 - The State of Illinois can own, operate and maintain airports. The current statutes provide for this to be accomplished by Division of Aeronautics of the Department of Transportation. Two airports, University of Illinois - Willard Airport and Dixon Springs are State owned but administered by the University of Illinois.

Municipal Airport Authorities - Pages 104-139 - This form of sponsorship is a special use district and attached is a copy of the procedures and time table of creating such a district. Illinois currently has 27 airports operating

under this statute. A Municipal Airport Authority allows for a specific defined area to be formulated to support the airport facilities contained therein. A petition of at least 500 electors must be filed to create the authority and a referendum must be obtained. The petition may also set forth a tax rate. The authority has the ability to levy two forms of taxation: (1) operation and maintenance; (2) to retire general obligation bonds for capital improvements. The Airport Authority Board is made up of an equitable representation of the district.

Counties in General - Page 139-144 - This form of sponsorship allows for a county to construct, own, operate and manage an airport if the airport is within its boundaries or on any land adjacent thereto. The county must have a referendum to provide general obligation bonds for the development of an aviation facility. A special airport fund must be set aside for the airport operation, maintenance and development when revenue bonds are issued.

Counties in General But Less Than One Million - Page 145-160 The smaller counties may acquire, establish, operate and maintain an airport and may by occasion issue bonds not to exceed .25 percent of the assessed valuation, which is provided to the County airport Fund. Such tax action requires a petition by at least 100 legal voters and referendum by the majority of voters. Bonds within prescribed limits may be issued based on the above referendum.

The airport may be administered by a Board of Directors appointed by the presiding officer of the County Board with advice and consent of the Board.

County Airports Act - Page 160-183 - The County Airports Act provides for a commission in counties not less than one million population to own and operate the airport. The Commission has the capability of creating a County Superintendent of Airports. Funding for the airport is through the general fund of the county. It is possible by referendum to levy a tax or borrow money by the issuance of general obligation bonds. Revenue bonds may also be used. In order to levy the tax a referendum is required. Joinder of counties may be accomplished by petition by 10 percent of the voters of adjoining counties.

Interstate Airport Authorities - Page 189-194 - The Interstate Airport Authority allows for the operation of an airport by governmental units in more than one state. It does require reciprocal authorizing legislation in the respective states. All powers are specific to the reciprocal clauses.

East St. Louis Airport - Page 194 - A very limited and concise statute empowers the Department of Transportation to acquire, own, maintain and operate a major airport facility in the East St. Louis metropolitan area, namely, St. Clair, Madison and Monroe Counties.

St. Louis Metropolitan Airport Authority Act - Page 194 - This act was repealed during the 84th General assembly.

Joint County-City Airports - Page 230-232 - this act provides for an intergovernmental agreement to establish joint sponsorship of city-county airports. The statute details the agreement and the powers and duties. This entity only has the powers which are vested in the corporate authorities and only to the extent that these authorities will give the powers to the Commission.

The Port Districts - Page 233-319 - Specific legislation has been written for any of the Port Districts to sponsor airport facilities. Each facility is a statute unto itself as are the powers thereto. Currently three airports are sponsored by Port Districts.

Cities and Villages - Page 320 - The Cities and Villages Act allows for airport sponsorship. However, it is defined in two parts: (1) airports for municipalities of 500,000 or more in population; (2) airports with municipalities of less than 500,000 in population. Most cities operate from the general fund of the city; however, it is possible by referendum to establish a dedicated airport tax. This tax cannot exceed .10 percent of the assessed valuation.

Park Districts - Page 350 - Park Districts are empowered to own, operate and maintain airports. It is possible under the park district code to levy a specific tax for the airport subject to approval by the voters. This tax cannot exceed .075 percent of the assessed valuation. There are many other specific requirements in the Park District code that are dissimilar to other forms of airport sponsorship.

***** End Compilation and Extract *****

A matrix outlining various sponsorship options and provision is shown at Figure 11-3.

11.5 Organizational Structure

Telephone interviews with management personnel at three separate airports in Illinois disclosed a great deal of favor for fully autonomous airport management with policy guidance and

direction at a commission or board level. The freedom of action afforded by this type of structure will depend largely on the joint use agreement provisions and the amount of air traffic involved. Figure 11-4 depicts some typical management structures. It is believed that a much simpler structure can be applied to Scott AFB. By way of example, the jet-port manager at Myrtle Beach, South Carolina (a joint use facility) is also the Director of the Airport System for Horry County which has a total of 4 airports. He has a staff of 3. This includes a deputy director, an administrative assistant and a computer operator. In addition there are airport police and grounds maintenance personnel.

11.6 Other Considerations

The Department of Defense of Defense policy for joint use military airfields states a requirement for a formal proposal submitted by a "local government agency eligible to sponsor a public airport." This is a broad ranging statement which precludes only a Federal government agency.

Currently there are about 24 military owned joint use facilities of which 17 are included in the National Plan of Integrated Airport Systems (NPIAS).

Eligibility for Airport Improvement Program (AIP) funds normally requires: (1) the airport development be included in the State Airport System Plan (SASP), (2) the National Plan of Integrated Airport Systems (NPIAS), (3) proper application by an eligible sponsor, (4) validated justification of the merit and priority of the proposal, (5) various environmental reviews.

11.7 Conclusion

Existing enabling legislation is sufficient to establish an appropriate authority to meet both Department of Defense joint use and Federal Aviation Administration AIP funding requirements.

FIGURE 11-3

SPONSORSHIP: STATE OF ILLINOIS

SPONSORSHIP	APPLICABLE TO JOINT USE						TYPICAL TYPE OF ADMINISTRATION			
	Eligible for Federal Funds	Has Bond Authority	Has Tax Authority	Requires Enabling Legislation	Requires Petitions	Requires Referendum	1. For Establishment	2. For Taxes	1. For Establishment	2. For Taxes
Municipality	X	X	X	0	X	X	X	X	X	X
County in General	X	X	X	0	N/S	N/S	N/S	N/S	N/S	N/S
County c1,000,000 Population	X	X	X	0	-	X	0	0	X	X
Separate Airport Authority	X	X	(-)	X	(-)	(-)	(-)	(-)	(-)	(-)
Port Authority	X	X	(-)	X	(-)	(-)	(-)	(-)	(-)	(-)
Park District	X	X	X	0	(-)	(-)	(-)	(-)	(-)	(-)
State	X	X	X	0	0	0	0	0	0	0

Notes:

(-) = Powers are dependent on wording of enabling legislation.

X = Yes

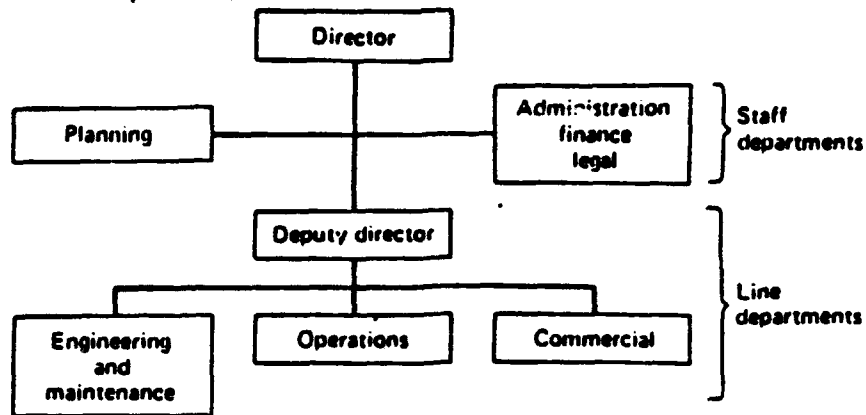
0 = No

N/S = Not specified but must meet requirements of law

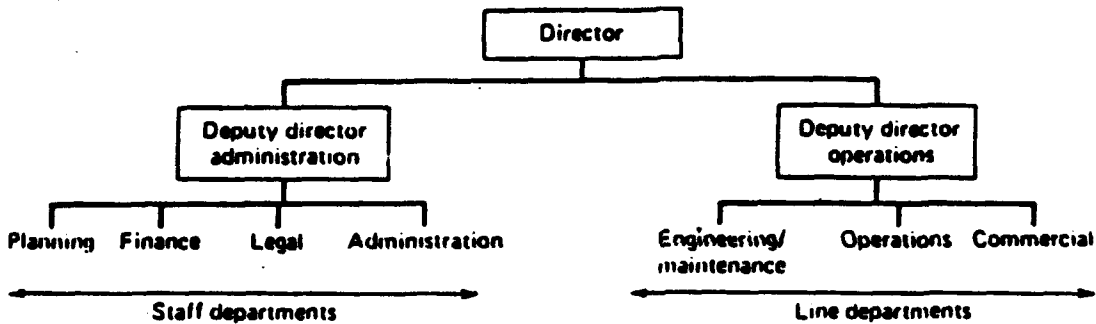
- = Requires 10% of each county's voters to petition for joinder action

Figure 11-4

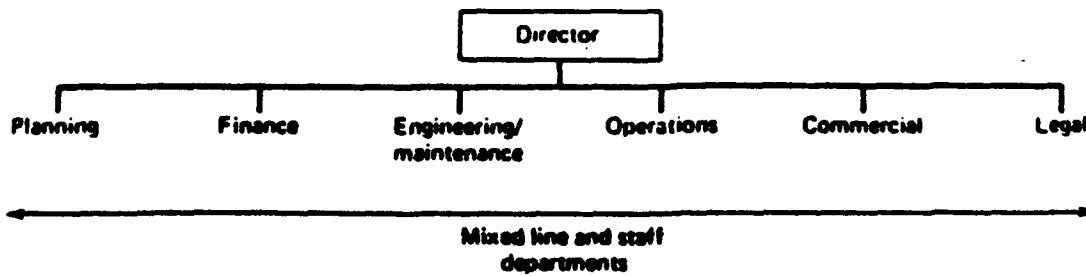
Option A



Option B



Option C



Source: Airport Operations, Ashford-Stanton-Moore

Section 12 Financial Analysis

12.1 Introduction

This section provides an overview of the financing requirements for implementing a joint use plan and briefly describes the ways in which the project can be financed.

The estimates of financing requirements are necessarily rough because the design and phasing of joint use improvements are still tentative, the selection of a sponsor not made, and financial market conditions may change considerably while the project is being developed.

Section 12.2 develops revenue and expense forecasts for Scott based on a survey and statistical analysis of revenues for airports comparable in size to forecast civil operations at Scott. It also contains a preliminary forecast of operating profit derived from the revenue and expense forecasts. Appendix 12.1 explains the basis for the forecasts and also compares the revenue and expense forecasts with landing fees and actual operating experience at existing joint use facilities.

Section 12.3 disaggregates the total capital expenditures into the annual capital cost and debt servicing imposed on the airport.

Section 12.4 combines these projections into cash flow forecasts for the years 1988 through 2005.

Section 12.5 considers possible sources for additional airport revenues and estimates their potential magnitudes.

12.2 Operating Revenues, Expenses and Profits

Revenue estimates are difficult to make because of the wide range of fees, rents, and other use charges levied by airports. The mix of services offered and prices charged for these services varies considerably from airport to airport and over time, based on changing demand and competitive conditions.

The civilian operation at Scott AFB would probably impose a mix of fees, rents and user charges from among the following major types of services:

- Use of air field facilities by airlines (e.g. runways and parking aprons,
- Lease of terminal space to airlines (e.g. ticket counters)
- Provision of services to concessionaries or directly to the public (e.g. newsstands, parking)
- Lease of other facilities to non-airline tenants (e.g. industrial areas).
- Sale of aviation fuel.

Because the range of possible configurations of fees, rents, and user charges is so broad, the study team estimated average revenue figures based on a sample of 26 airports (See Appendix 12-1). Revenues were estimated on both a "per passenger" and "per operations" basis, with the per operations basis believed to be the more relevant to civil usage of Scott AFB. The results of this analysis are summarized in Table 12-1. Based on the analysis, the team has developed a revenue factor of \$110.32 per commercial operation as the best factor for forecasting revenues.

Table 12-1

PROJECTION BASED ON:
(in 1984 dollars)

YEAR	PASSENGER			COMMERCIAL OPERATIONS		
	OPERATING REVENUE	OPERATING EXPENSES	OPERATING PROFIT	OPERATING REVENUE	OPERATING EXPENSES	OPERATING PROFIT
1990	552,970	422,290	130,680	1,323,840	992,760	331,080
1991	695,549	531,176	164,373	1,463,296	1,097,340	365,956
1992	874,891	668,139	206,752	1,617,443	1,212,936	404,507
1993	1,100,476	840,416	260,060	1,787,828	1,340,709	447,119
1994	1,384,226	1,057,115	327,111	1,976,162	1,481,943	494,219
1995	1,741,170	1,329,690	411,480	2,184,336	1,638,054	546,282
1996	2,279,105	1,740,499	538,606	2,631,038	1,973,040	657,998
1997	2,983,236	2,278,227	705,009	3,169,092	2,376,532	792,560
1998	3,904,908	2,982,087	922,821	3,817,180	2,862,538	954,642
1999	5,111,332	3,903,404	1,207,928	4,597,803	3,447,935	1,149,868
2000	6,690,480	5,109,360	1,581,120	5,538,064	4,153,046	1,385,018
2001	7,622,376	5,821,026	1,801,350	6,051,438	4,538,030	1,513,408
2002	8,684,072	6,631,817	2,052,255	6,612,400	4,958,701	1,653,699
2003	9,893,648	7,555,541	2,338,107	7,225,364	5,418,368	1,806,996
2004	11,271,702	8,607,927	2,663,775	7,895,149	5,920,646	1,974,503
2005	12,841,700	9,806,900	3,034,800	8,627,024	6,469,486	2,157,538

By using the derived revenue per commercial operation and the levels of traffic forecast, annual operating revenues of \$1.3 million were projected for 1990, rising to \$8.6 million by 2005. Alternatively using the average revenue per passenger from the airport sample produced an annual operating revenue of \$553,000 in 1990, increasing to \$12.4 million in 2000. Forecast results were then checked and corroborated by estimating total airport revenues based on landing fees (See Appendix 12.2).

Operating cost forecasts, especially for a joint use facility such as contemplated for Scott AFB, are also subject to considerable uncertainties. Not only will operating costs depend critically on the level and mix of services ultimately provided, but there is also uncertainty about the degree to which facilities and costs will be shared with the Air Force.

Because of the range of factors that influence costs, the study team examined aggregate operating cost data using the same set of airports as for the operating revenue estimates (Also included in Appendix 12.1). The review of operating costs at these 26 airports suggests an average cost of \$82.73 per commercial operation. At the forecast traffic levels, operating costs were thus estimated at \$993,000 in 1990, increasing rising to \$6.5 million in 2005. Alternatively for these same airports, the average operating cost per passenger was \$3.49, yielding total operating expenses ranging from \$422,290 in 1990 to \$9.8 million in 2005.

These estimates of operating costs suffers from two partially offsetting biases when applied to Scott AFB. On the one hand, there are diseconomies of scale and start-up costs which would make the cost per operation higher than our estimate in the early years of joint use operations.

Conversely, the fact that significant use can be made of existing Air Force facilities should substantially reduce the average cost of operations particularly in the early phases.

In order to assess the impact of these offsetting considerations, the team separately projected civilian operating costs at Scott AFB by examining actual expenses at two existing joint use airports. (See Appendix 12.1 for details.) This independent analysis also corroborated the estimate of aggregate operating cost estimates based on the airport sample. Joint use expense data is shown at Table 12-D.

12.21 Operating Ratios.

Although many different ratios may be used in calculating the financial condition of airports, the single most important one is the operating ratio. The operating ratio is derived by dividing the operating (including the maintenance) expenses by the operating revenues. This ratio measures the degree to which operating costs preempt operating revenue flows, thereby reducing the amount available to cover debt service or capital expansion.

Based on the above revenue and expense forecasts, an operating ratio of 75 percent is projected for Scott AFB. Although less favorable than the 50 percent operating ratio that the Congressional Budget Office found for a large sample of airports, it compares more favorably to the 62 percent operating ratio for medium-sized airports in the 1979 to 1982 period.^{1/} The CBO study also found that several other types of public enterprises had operating ratios in the same general range as is forecast for Scott. For example, electricity

^{1/} Financing U.S. Airports in the 1980s, Congressional Budget Office (U.S. Government Printing Office, 1984).

generation had an operating ratio of 77 percent; electricity distribution, 79 percent; and, water supply and waste water treatment, 68 percent.

Considering the conservative basis of the forecast of operating revenues and expenses, the study team believes that Scott AFB would have an acceptable operating ratio. However, as shown below, the surplus of revenues over operating costs still falls short of the level necessary to cover debt service.

12.3 Capital Cost Impact

The overall cost for full development of Scott AFB as a joint use facility is estimated at \$360 million. The capital expenditures would be incurred in four (4) stages between 1988 and 2005. The development plan assumes that the capital outlays would occur in equal amounts in each of the two years preceding 1990, 1995, 2000 and 2005, as follows:

Capital Outlays

Years	1988-1989	1993-1994	1998-1999	2003-2004
Stage	1	2	3	4
Cost	\$ 75M	\$150M	\$ 85M	\$ 50M

The uncertainty surrounding the conflict between Administration budgetary policies and Congressional efforts to increase expenditures from the Airport and Airways Trust Fund makes any predictions regarding possible Federal cost sharing extremely difficult. Therefore, the Report analyzes two alternative scenarios for Federal grants, one at 20 percent of capital costs and the other at 10 percent.

In addition to the amount of Federal cost-sharing, considerable uncertainty surrounds the financing costs. Given the volatility in municipal bond markets, prevailing interest rates may differ significantly from those forecast. For illustrative purposes, alternative interest rates of 6 percent and 8 percent are postulated (the current rate is in the 7.5 percent range). This is a conservative approach because the financial calculations are all in constant 1985 dollars. Thus the appropriate interest rates to use in most calculations would be the "real" rate (i.e. the market rate minus projected inflation). The long term cost of servicing the bond issues, therefore, should be less than the postulated range because inflation will reduce the relative financing cost as the value of the underlying capital assets increases.

Table 12-2 summarizes the capital outlays and annual interest costs required to fully develop Scott AFB as described in Section 5. The annual interest cost ranges from about \$2 million per year in 1988 to more than \$25 million per year by 2005. Under more optimistic assumptions about Federal grants and interest rates (i.e. 20 percent Federal grants, 6 percent interest) the total debt service cost will be about \$190 million. Under more pessimistic assumptions, (i.e. 10 percent Federal grants, 8 percent interest) total debt service will be over \$280 million.

Table 12-2
Annual Capital Expense
(\$ in millions)

Year	Annual Capital Outlay	Cumulative Total Capital Outlay	Annual Interest Cost	
			A*	B*
1988	\$ 37.5	\$ 37.5	1.8	\$ 2.7
1989	37.5	75.0	3.6	5.4
1990	0	75.0	3.6	5.4
1991	0	75.0	3.6	5.4
1992	0	75.0	3.6	5.4
1993	75.0	150.0	7.2	10.8
1994	75.0	225.0	10.8	16.2
1995	0	225.0	10.8	16.2
1996	0	225.0	10.8	16.2
1997	0	225.0	10.8	16.2
1998	42.5	267.5	12.8	19.3
1999	42.5	310.0	14.9	22.3
2000	0	310.0	14.9	22.3
2001	0	310.0	14.9	22.3
2002	0	310.0	14.9	22.3
2003	25.0	335.0	16.1	24.1
2004	25.0	360.0	17.3	25.9
2005	0	360.0	17.3	25.9
Total	360.0	360.0	189.7	284.3

* A is based on 20 percent federal cost sharing and debt service payments at 6 percent per year. B assumes 10% federal cost sharing and debt service payment at 8 percent per year.

Section 12.4 Cash Flow Analysis

Subtracting the projected operating profit from the interest costs leaves the residual net interest cost to be paid. The results presented in Table 12-3 show that, as is usually the case for newer and smaller airports, operating profits at Scott will be insufficient to cover both operating and capital costs during the forecast period.

Table 12-3
Cash Flow
(\$ million 1984)

Year	Operating Profit	Annual Interest Cost		Net Financial Requirements	
		A*	B*	A*	B*
1988	-	1.8	\$ 2.7	1.8	2.7
1989	-	3.6	5.4	3.6	5.4
1990	0.3	3.6	5.4	3.3	5.1
1991	0.4	3.6	5.4	3.2	5.0
1992	0.4	3.6	5.4	3.2	5.0
1993	0.4	7.2	10.8	6.8	10.4
1994	0.5	10.8	16.2	10.3	15.7
1995	0.5	10.8	16.2	10.3	15.7
1996	0.7	10.8	16.2	10.1	15.5
1997	0.8	10.8	16.2	10.0	15.4
1998	1.0	12.8	19.3	11.8	18.3
1999	1.1	14.9	22.3	13.8	21.2
2000	1.4	14.9	22.3	13.5	20.9
2001	1.5	14.9	22.3	13.4	20.8
2002	1.6	14.9	22.3	13.3	20.7
2003	1.8	16.1	24.1	14.3	22.3
2004	2.0	17.3	25.9	15.3	23.9
2005	<u>2.2</u>	<u>17.3</u>	<u>25.9</u>	<u>15.1</u>	<u>23.7</u>
	16.6	189.7	284.3	173.1	267.7

* A is based on 20 percent federal cost sharing and debt service payments at 6 percent per year. B assumes 10% federal cost sharing and debt service payment at 8 percent per year.

12.5 Financial Plan

Proposed revisions in the federal taxation of municipal bonds and in the types of undertakings eligible for municipal bonding have created major uncertainties for airport financing. Thus a definitive financing plan will depend to a significant degree on the tax code provisions which emerge from current Congressional deliberations. Two types of changes in particular could have potential impact on a financing plan for a joint use facility at Scott Air Force Base. The first would restrict eligibility for tax exempt municipal bond financing to specified "governmental" or "essential" activities such as road building, park land acquisition, etc.

Although it is likely that most airport activities would be eligible for tax exempt financing, that eligibility will probably be restricted to certain types of projects, such as runways, taxiways, and so forth. The tax exempt status of bonds for airport-financed industrial parks and similar commercially viable activities, however, appears to be in jeopardy, while the future tax status of bonds for terminal and cargo facilities falls somewhere in between. Projects which fail to qualify for tax exempt financing will incur somewhat higher interest charges.

The second tax code change which could affect the financing cost of a joint use facility at Scott Air Force Base is the proposed extension of the minimum tax to include interest from tax exempt bonds. Stricter minimum tax provisions would also increase costs for projects financed by municipal bonds.

The study team believes that any comprehensive analysis of financing options should be deferred until it becomes clear what changes, if any, will be made in the tax treatment of municipal bonds and the development costs are refined.

Successful financing for the development of Scott AFB as a joint use facility will depend on a number of factors. Key considerations will include the availability and extent of Federal funding, the ability to attract appropriate tenants and users (e.g., a small package hub) whose rental and other fees can support the issuance of revenue bonds, the ability to generate additional revenues from non-traditional sources (e.g. industrial parks), and the willingness of state and local authorities to provide general obligation bond funding.

12.51 Federal Funding

The Federal government has historically funded a significant portion of the Nation's investment in airports. Between 1960 and 1982, the Federal share of total U.S. cumulative airport investment was \$9 billion out of a total investment of \$25 billion. During the 1978-82 period, Federal grants contributed 35 percent total investment for all airports, and 69 percent for small airports.^{1/}

At present, there is substantial uncertainty regarding the extent of future Federal funding. It seems safe to assume that the FAA (and Congress) will continue to provide funding for reliever airports -- a category which could possibly fit joint-use facility at Scott AFB. In addition, a major effort is currently underway which, if successful, would force the Federal government to substantially increase funding for airport and airways improvements. Alternatively, Congress may approve legislation to defederalize airports and/or permit airports to impose taxes directly on airline passengers.

^{1/} Airport System Development, Office of Technology Assessment, 1984

Notwithstanding the current uncertainties, the study team believes that Federal funding the airport investments will remain a significant source of airport investment capital. The plan for obtaining the necessary financing for develop of a joint use facility at Scott reflects the assumption that 10 to 20 percent of the costs will be Federally funded.

12.52 Additional Funding Sources and Alternatives

The net financing requirements identified in Table 12-3 do not take account of a number of potential sources of additional funding. Some of these additional sources include rental of land, related development projects, private funding, and access roadways and parking.

12.521 Land Rental

\$3.55 million of the investment required for stage I development is earmarked for acquisition of 1500 acres of land. Since the land is not required for airport usage until stage 2 construction begins in 1993, the airport could earn revenues from leasing the land for farming.

A rental rate of \$100/acre/year for the 1,000 acres of prime farm land would produce \$100,000 per year in additional revenue, or \$500,000 over the initial 5 year period. For 1990, \$100,000 would represent an increase of 30 percent in forecast operating profits.

After the completion of all planned construction at Scott, much of the land could be returned to production. It is estimated that as much as 40 percent of the 1,000 acres of prime farm land could be revenue producing.

12.522 Related Development Projects

In addition, it may be possible to develop land for an industrial park in conjunction with joint-use airport at Scott. Massport, for example, recently opened a high technology complex on the ground at Boston's Logan airport. Likewise, the airport at Lincoln, Nebraska derives substantial revenues from an industrial park. By developing complementary projects within their boundaries, both of these airports have been able to generate increased non-airline revenues while stimulating demand for air services.

A joint-use facility at Scott could develop similar projects, perhaps in conjunction with a broader regional economic development plan. In addition to an Asian cargo and auto parts distribution center discussed in Sections 2 and 3, other candidates could include an industrial park or distribution centers for computer parts and equipment, medical products, or other high value goods. No attempt has been made to estimate the magnitude of revenues from this type development since the selection of the most appropriate projects for development at Scott will require further study. But it is anticipated that financing for such projects would be provided either by private sources or by means of bonds secured by project revenues and thus would not add to general obligation financing requirements.

12.523 Private Funding for Cargo Related Improvements

Stage I capital investment for cargo related improvements (excluding land acquisition) amounts to \$28.3 million. These expenditures need not be incurred until the airport has secured commitment(s) from a small package express, all cargo airline or other cargo operators. Rentals and other revenues from such cargo operations could then be expected to cover the costs of

building the required facilities. Indeed, a cargo facility might well be financed by issuance of revenue bonds, although Congress is presently considering tax code revisions which could reduce the feasibility or desirability of using such bonds.

12.524 Funding for Passenger Facilities

Although major funding for passenger terminal facilities is scheduled to begin in stage 2, it could be deferred if necessary to coincide with actual traffic levels.

But unlike the situation with cargo, the study team does not anticipate development of a passenger hub at Scott during the forecast period. Passenger carriers will serve Scott as a spokes into their existing hubs, with several flights per day per carrier. Revenues to cover capital costs for the passenger terminal would have to come from a number of different airlines and other concessionaires. As a result, it is unlikely that any individual passenger carrier would be willing to make a major capital investment in terminal facilities. Rather, they would prefer to have facilities built and developed by some other party. The prospects for private funding, therefore, are lower for the passenger facilities than for cargo.

Nonetheless, the study team believes that the passenger facilities could become financially self-sustaining over a longer time period, and might ultimately be financed by revenue bonds.

12.525 Access Roadways and Parking Facilities

Airport parking facilities typically generate revenues in excess of those required to cover their own operating and capital costs. Parking lots at Scott are thus not expected to

impose any burden on net financing requirements. Both the parking lots in Stages 1 through 3 and the parking structure scheduled for stage 4 should be self-sustaining and eligible for revenue bond financing.

In a similar vein, by using a toll system, the airport (or state or county) could generate revenues sufficient to amortize the cost of building and maintaining the airport access road.

12.526 General Obligation Funding

Even after recognizing that net project financing requirements can be substantially lowered by a combination of measures which either increase projected net income (e.g. land rentals) or provide for self-funding capital projects (e.g. cargo facilities), a substantial amount of state and local government financing will be required to develop Scott.

The reasons for this are several. First, as discussed in Section 5, the substantial capital investments in new runways and taxiways are not required to satisfy projected commercial demands during the forecast period, but to meet military requirements. Thus, almost by definition, the airport will be "overbuilt", and hence unlikely to be fully self-sustaining, until traffic growth raises runway capacity utilization, sometime after 2005. Of the estimated program cost of \$357 million through 2005, the study team estimates that between \$150 million and \$200 million of that amount could be financially self-sustaining within the forecast period. Thus, at a minimum, some \$150 to \$200 million of general obligation funding is likely to be required.

Second, virtually all newly-built airports require time to build up sufficient traffic to cover both operating and capital costs. This is particularly true for secondary airports in major metropolitan areas.

Notwithstanding the start-up deficits, the substantial economies resulting from joint-use of existing facilities at Scott make it a low cost alternative for providing airport system capacity sufficient to sustain St. Louis' position in the national air transportation system.

12.6 Conclusions

- o Operating revenues from civilian operations at Scott AFB should exceed operating costs.
- o The surplus of operating revenues over operating costs will fall far short of the level necessary to pay interest costs resulting from capital investments at Scott AFB.
- o Some additional revenues can be realized (e.g. land rentals, industrial park operations), and some private financing of facilities may reduce public financing requirements.
- o The bulk of financing for joint use capital investments at Scott AFB, however, will require issuance of general obligation bonds by State or local authorities.

Section 13 Conclusions and Recommendations

13.1 General

This Feasibility Study for Joint Military-Civil Use of Scott Air Force Base is timely in that it follows the recent joint policy announcement by the Departments of Defense and Transportation supporting civil use of military facilities where feasible.

During the initial phase of this study, extensive communications were held with the Air Force and with potential commercial users of Scott. The responses of these parties were generally positive and warranted continuation of the study to cover physical layout, environmental, economic, and financial considerations.

The physical planning undertaken in the second phase of the study was at a level of detail sufficient to provide a preliminary basis for judging feasibility. Also it gives basic information which the Air Force, the State of Illinois, potential sponsors, and potential users can utilize. Further, it provides the general public with an overview of the key aspects of joint use at Scott ArB. The concepts and the cost estimates presented cannot substitute for detailed master planning. Of particular importance is the need for a comprehensive and detailed environmental assessment as part of the master planning process.

13.2 Conclusions

1. It is feasible to develop Scott AFB for civil use in a manner that is acceptable to the U.S. Air Force.
2. There is sufficient potential civil air traffic demand to justify civil use of Scott. In view of the airport capacity shortage in the St. Louis region, Scott has the potential of contributing significantly to the future supply of capacity.
3. The economic benefits to Southwestern Illinois that could flow from civil aviation activity at Scott should justify state and local support, including local sponsorship.
4. The airport configuration proposed, consisting primarily of a new runway and terminal complex east of the existing military facilities, is the best alternative to pursue at this time.
5. The location and staging of civil development is consistent with the objectives of maintaining a separation of civil and military facilities while at the same time constructing civil facilities as demand develops.
6. The development proposal is environmentally feasible, particularly from the standpoint of noise impacts. The potential impacts on the Silver Creek wetlands and floodplains can be mitigated by appropriate engineering measures.
7. Scott is well located in the St. Louis region with respect to ground transportation.
8. The civil facility will not be financially self sufficient in the foreseeable future. However, the cost of developing and operating civil facilities is reasonable when compared to other alternatives for supplying equivalent capacity, such as the development of an entirely new commercial airport.

13.3 Recommendations

- o Establish local sponsorship for civil airport facilities at Scott.
- o Develop a joint use agreement with the U.S. Air Force.
- o Apply to the FAA for AIP funding of an airport master planning project which includes the necessary study activities supportive of an Environmental Impact Statement, public information sessions and a specific financing strategy.
- o Establish executive level communications with potential airlines, interests, and the public for the purpose of promoting civil use of Scott AFB. This should be supported by a comprehensive marketing prospectus.
- o Initiate necessary discussions aimed at establishing a bi-state Advisory Committee to coordinate Scott planning as an integral element of the regional airport system.

The comprehensive information made available to the IPAC-TAMS team by Scott AFB and IDOT staffs was invaluable and their continuing support and cooperation was appreciated.

Appendix 1.1 List of individuals interviewed

This appendix is a compilation of the individuals interviewed in conjunction with performing the work in Section 1.

Department of the Air Force

Mr. James Boatright - Deputy Assistant Secretary
(Installations, Environment and Safety)
(SAF/MII) The Pentagon, Room 4C90

Headquarters, United States Air Force

Maj. Gen. Robert Messerli - Assistant Deputy Chief of Staff
Programs and Resources
(AF/PR) The Pentagon, Room 4E1020

Maj. Gen. H. T. Johnson - Director of Programs and Evaluation
(AF/PRP) The Pentagon, Room 4E991

Colonel John Sievertson - Deputy Director of Bases and Units
(AF/PRPJ) The Pentagon, Room 5C966

Colonel William Morrison - Chief, Special Activities Division
(AF/PRPJA) The Pentagon, Room 5D970

Mrs. Ruth Ann Young - Civil Aviation (AF/PRPJA)
The Pentagon, Room 5D970

Maj. Gen. A. Kent Davidson - Director of Plans, (AF/XOX)
The Pentagon, Room 4E1046

Headquarters Military Airlift Command, Scott AFB, Illinois

General Duane Cassidy, CINCMAC

Maj. Gen. William Overacker, Deputy Chief of Staff Operations
(MAC/DO)

Maj. Gen. Tony Bursnick, Deputy Chief of Staff Plans (MAC/XP)

Brig. Gen. Edsal Field, Assistant Deputy Chief of Staff Plans
(MAC/XP)

Colonel E. P. Brown, Airlift Information Systems Division, Air
Traffic (AISD/AT)

Headquarters 23rd Air Force

Maj. Gen. William Mall, Commander, 23AF/CC Incumbent

Maj. Gen. Robert Patterson 23AF/CC (select)

Headquarters 375th Aeromedical Airlift Wing

Colonel Louis Pelini, Commander 375 AAW/CC

Headquarters 375th Air Base Wing

Colonel George Dixon, Commander 375 ABG/CC

Lt. Colonel John O'Morrow, Chief, Airfield Management.

Headquarters, Air Force Communications Command, Scott AFB, IL.

Air Traffic AFCC/AT:

Colonel Couture

Colonel Spear

Mr. Hardin

Air Reserve Forces

Mr. Evans, National Guard Bureau, Washington, D.C.

Colonel Solomon, Air Force Reserves

Appendix 1.2 Extracts of DOD and USAF policies, regulations and requirements

The Plan for Joint Use of Military Airfields, published March 1984 by Department of Defense (DOD) and Department of Transportation (DOT), pursuant to Section 504 (d)(3) of the Airport and Airway Improvement Act of 1982 (Public Law 97-248) is an all inclusive document that contains the policies, procedures, criteria and regulations concerning joint use of military airfields. Pertinent extracts, with study team comments, are listed here. The section and page numbers at the headings indicate where the extract is located in the DOD/DOT plan.

EXTRACT

* * * * *

EXECUTIVE SUMMARY

CRITERIA (Sec. I. page 3)

From this policy, the following criteria for submitting and evaluating joint use requests have been developed:

Submitting Joint Use Requests - Joint use requests will be considered when proposed by a local government agency eligible to sponsor a public airport. Civil operations must begin within five years of formalizing the agreement between the concerned service and the local government agency.

Evaluating Joint Use Requests - Generally, an airfield will be considered for joint use if it does not have a nuclear alert force, pilot training (student or qualification), nuclear storage, or a major classified mission. Joint use operations should not require (a) colocation of military and civil aircraft, (b) routine

access to the civil facilities through the installation, or
(c) increased airfield operating hours.

When evaluating each proposal, the appropriate military department, at a minimum, considers the following:

- a. Airspace
- b. Traffic mix
- c. Installation mission (current and future)
- d. Type of proposed civil use
- e. Existing civil facilities
- f. Airfield configuration
- g. Availability of land
- h. Navigation aids
- i. Fire, crash, and rescue capabilities
- j. Aircraft arresting systems
- k. Encroachment
- l. Security
- m. Manpower requirements
- n. Reimbursement terms
- o. Environmental impact

IPAC Note: The criteria for the evaluation of the above listed factors is discussed in section 1.6.

CONCLUSION (Sec. I, page 5)

Joint use should be permitted to the maximum extent compatible with national defense. National, state, and regional airport system plans indicate that additional airport capacity is needed. Joint use represents one technically feasible alternative for obtaining additional airport capacity. A major factor in achieving joint use, noted in the Comptroller General's report to Congress on March 1, 1983, is full cooperation between the military and the civil parties involved.

Some military airfields are compatible with civil operations. However, each airfield is unique and specific proposals must be evaluated on a case-by-case basis.

EXTRACT

* * * * *

DISCUSSION (Sec. III, Page 11)

The Federal Aviation Act of 1958 established the authority regulating public use of government-owned airfields.

Sec 1107 [72 Stat. 798, 49 U.S.C. 1507] (a) Air navigation facilities owned or operated by the United States may be made available for public use under such conditions and to such extent as the head of the department or other agency having jurisdiction thereof deems advisable and may by regulation prescribe.

Through this authority, the appropriate military departments consider specific proposals for joint use.

In order to ensure consistent, systematic evaluation of each proposal, detailed criteria for submitting and evaluating requests have been developed and are described in Section IV. As a rule, the military airfield under consideration must be able to accommodate the proposed operations and such operations must not (a) introduce unacceptable interference to the military mission, (b) degrade safety, (c) impose security risks, or (d) hamper the DOD in training for and maintaining national defense readiness. It must be recognized that there is a certain amount of subjectivity required in these evaluations, and good judgment will be exercised when applying these criteria.

EXTRACT

* * * * *

JOINT USE PROCEDURES

GENERAL (Section IV, p. 12)

Joint use should not be considered a panacea for the future needs of this nation's airport system. Military facilities are funded and retained in the DOD inventory only to the extent necessary to support the current and programmed force structure required to fulfill national defense needs. Military installations have been established to facilitate the training required to maintain defense readiness and to provide the operational capacity necessary to defend our nation. However, the appropriate military department will consider, on a case-by-case basis,

all specific, sponsored proposals for joint use determination. The criteria are representative of those factors that minimize the impact of joint use on military readiness, response, security, and safety. These have been developed as the result of experience and sound military judgment.

SUBMITTING JOINT USE REQUESTS (Section IV, p. 13)

Sponsor Requirements: Joint use of a military airfield is considered on a case-by-case basis when a proposal is submitted, through channels, to the appropriate military department by a local/community government representative (public agency) eligible to sponsor a public airport

For the purpose of joint use requests (and in accordance with PL 97-248) a public agency is:

A state, or agency of a state, a municipality, or other political subdivision of a State, a tax supported organization, or Indian tribe or pueblo.

This definition ensures that the sponsor will be eligible to receive FAA grants and minimizes the risk of a military department becoming financially responsible should a sponsor become unable to meet their obligations.

Specifics: The regulations and procedures of each military service establish the specific details to be included in the application. Each proposal should include the type of operation, type of aircraft, and estimated annual operations. These data will be evaluated with the criteria discussed later in this section. The joint use determination is based upon the specifics in each proposal and may change if the proposal changes.

Time Limits: Joint use activities should begin within five years following approval of the proposal. Initiation of activity may consist of either flying operations or the allocation of the preponderance of funds necessary to support those operations. The "five year" rule defines the limits of fiscal planning, and ensures that decision makers evaluate requests against known military activities.

CRITERIA FOR EVALUATION

Airspace/Air Traffic Control Criteria: Operational considerations are based on the premise that military aircraft will receive priority handling (except in emergencies), if traffic must be adjusted or resequenced. Manpower increases required in air traffic control or related support activities, as a result of the civil operation, would have to be accommodated outside DOD resources. Additional equipment or physical airfield changes must be funded by the civil sponsor. Specific items considered are:

- a. Airspace saturation
- b. Special military airspace requirements
- c. VFR/IFR approach compatibility
- d. Departure pattern
- e. Traffic flow capability
- f. ATC facility capacity

Requests for joint use will be coordinated with the appropriate FAA Regional Office to determine the effects on the safe and efficient use of airspace by aircraft.

Traffic Mix Criteria: The dissimilar operational characteristics/procedures between civil and military aircraft increase the potential for midair collisions and accidents/incidents. The following items are considered in evaluating the traffic mix aspect of joint use:

- a. Aircraft weapons
- b. Aircraft wake turbulence
- c. Helicopter operations
- d. IFR vs VFR
- e. High performance aircraft
- f. Training mission

Military Activity Criteria: The following items are considered from a mission compatibility perspective:

- a. Mission impact
- b. Location of special material storage or loading area (Joint use should not be considered at installations with nuclear storage areas)
- c. Installations involved in training of military student pilots should not be considered for joint use
- d. Joint use should not be considered at locations with a nuclear alert force mission

- e. Installations subject to no-notice inspections or frequent exercises that impact flying operations should not be considered for joint use
- f. Ongoing classified programs, when civil access may jeopardize security
- g. Joint use must not adversely reduce flexibility for present or future force bed-down or other related activities
- h. Mobilization activities

Civil Aircraft Equipment and Aircrew Qualification
Criteria: The following qualifications/capabilities are normally required for civil aircraft and pilots:

- a. IFR qualified crews
- b. Aircraft IFR certified
- c. Two-way radio
- d. Transponder

Facilities Criteria: The majority of land for civil facilities must be located on the perimeter of the military installation or be segregatable in a manner which does not detract from installation security. Federal legislative jurisdiction should be retroceded to the State after joint use goes into effect, particularly in exclusive use and access areas. Military approval is required on siting, design and construction of civil facilities. Joint use will not normally be considered at locations with single runway capacity. The following items will be considered in evaluating the impact of joint use on facilities.

a. Civil Facilities:

- (1) Availability of existing local civil facilities
- (2) Practicality of constructing/expanding a civil airfield

b. Runway/Taxiway:

- (1) Pavement strength for wheel loading
- (2) Pavement width/length
- (3) Capacity
- (4) Dual or single runway
- (5) Access to runway from civil facilities

c. Civil Location:

- (1) Availability of non-governmental land for taxiway, terminal, ramp, fuel storage, hangar, maintenance, etc.
- (2) Availability of excess government-owned land for civil facilities

d. Navigation Aids: The DOD will not provide manpower to install, operate, or maintain navigation equipment for the sole use of civil aviation. Consideration must be given to the adequacy of existing navigation aids for the civil operation.

e. Fire, Crash, Rescue:

(1) Equipage

(2) Manpower

f. Noise Barriers:

(1) Existing configuration

(2) Civil requirement

g. Aircraft Arresting Systems (AAS): The DOD will not install, alter, or remove AAS for use or convenience of non-military traffic; therefore, consideration must be given to:

(1) Existing configuration

(2) Civil requirements

h. Air Installation Compatible Use Zone (AICUZ): Study required in conjunction with airspace analyses to include:

(1) Runways to be used

(2) Traffic Distribution

(3) Peak hour use

(4) Schedule of operating hours

(5) Engine signatures

(6) Approach/departure profiles

(7) Climatic data

Security: Clear separation of military and civil activities is essential to avoid increased security costs and greater threat to priority and sensitive resources. Joint use increases the possibility for sabotage, terrorism, and vandalism. Joint use will not be considered if military and civil aircraft will be colocated on the same parking ramp or when other than normal airfield facilities are to be shared. Further, joint use will not be considered if access by non-government personnel would be routinely required to transit the base. Specific security aspects to be considered in joint use are:

- a. Access of public to military resources
- b. Impact on manpower if increased security is required

Manpower Criteria: The following items must be considered from the perspective of impact on manpower and military career limitations:

- a. Workload vs manpower level
- b. Possibilities for contract or civilianization of ATC facilities (cost comparison studies)
- c. Impact on rotation for air traffic control personnel

Financial Criteria: Any logistic support or utilities provided by the government are reimbursable. Some

reimbursable items include labor, equipment use, and any supplies provided. The civil sponsor must pay a prorated share for maintenance and operation of the government runway. All real property outleased will be processed through the Corps of Engineers at fair market value. The following must be considered in evaluating joint use proposals:

- a. There must be no cost to DOD appropriations
- b. Reimbursement through services in lieu of user fees
- c. There must be no significant indirect costs
- d. The sponsor must have funding available for the civil facilities

Environmental Criteria: The appropriate environmental analysis is required in developing joint use agreements. The sponsor of the civil operation shall be required to pay for the environmental impact analysis which will be conducted by the DOD as lead agency and the FAA and other applicable federal agencies as cooperating agencies. Within the process, each agency shall be responsible for ensuring that the analysis policies and procedures. Compliance with FAA procedures is necessary when the FAA must make decisions on the civil aviation aspects of the joint use proposal.

* * * * *

END EXTRACT

USAF Requirements

Air Force Regulation 55-20 titled Use of United States Air Force Installations By Other Than United States Department of Defense Aircraft dated 18 February 1974 is the authority under which the Illinois Department of Transportation (IDOT) proposal would be reviewed and is contained in the DOD/DOT document. Operative sections are quoted herewith:

SECTION E - JOINT USE OF A USAF INSTALLATION (Appendix 1, Service Regulations, AF Reg 55-20, p. 10)

22. Requests for Joint Use. Joint civil aviation use of a USAF installation is considered only when requested by authorized governmental representatives of a community. Such requests are considered and evaluated on an individual basis by all reviewing levels.

a. To initiate consideration for joint use of a USAF installation, submit a request to the installation commander, and include the following:

(1) Type and number of aircraft to be located on the installation.

(2) If applicable, an estimate of the number of commercial operations annually over a 5-year period.

b. The installation commander, on receipt of the request, without precommitment or comment, forwards the documents to the Air Force representative at the FAA regional office within the geographical area of installation location.

c. The USAF is responsible for the preparation of the environmental statement. Any costs associated with the preparation of the statement are borne by the requester.

d. The Air Force representative at the FAA regional office comments on the request regarding airspace, air traffic control, and any other related areas, and returns the request with his comments to the installation commander.

e. The installation commander comments on the request and forwards his comments and all related documents through channels to HQ USAF/PRPO.

f. HQ USAF/PRPO, when evaluating the request, considers all of the following factors:

(1) The current and programmed military activities at the installation, dual runway and taxiway facilities, security, - availability of supplies and maintenance service, volume and type of military traffic, crash protection, etc., and the extent to which the proposed use might detract from the installation capability to meet national defense needs.

(2) Availability of public airports to accommodate the current and future civil aviation requirements of the community and the practicality of constructing or expanding a public airport.

(3) Availability of sufficient land for civil facilities in an area separate from the Air Force facilities. If the community does not already own the land needed, the necessary land must be acquired either by purchase at no expense to the US Government or from land that is excess to Air Force needs. The availability of excess USAF installation land may be requested through the FAA and the General Services Administration (see 50 App U.S.C. 1622(g)). The Air Force considers temporary use of real property under AFR 87-3.

(4) Whether the community would acquire, construct, and maintain all necessary facilities for civil aviation operations; for example, a terminal building, parking ramp, taxiways, and, if appropriate, a civil runway.

(5) Whether the community would reimburse the US Government a proportionate share of the costs for maintenance and operation of the runway and other utilized facilities.

f. If HQ USAF/PRPO approves the request for joint use, an agreement, will be negotiated and concluded on behalf of the Air Force. The joint-use agreement will state the extent to which the provisions of this regulation will apply to all civil aviation use authorized.

Appendix 1.3 Pertinent Synopses of Joint Use Agreements

The five joint use agreements currently in force judged to be the most representative are those at Dover, Eglin, Myrtle Beach, Rickenbacker and Westover Air Force Base.

A review of these negotiated agreements indicates a number of areas with commonality. Relevant portions are listed below.

A. Authorization to Use Facilities

- Dover AFB - Delaware Transportation Authority
 approved commuter and general aviation
 aircraft
- multi-engine
 - instrument certified
 - two-way radio
 - instrument rated pilots
 - no hazardous cargo in violation of
 FAA or USAF regulations
 - final approval 24 hours in advance
 of arrival.
- Eglin AFB - scheduled air carrier operations only
- maximum load of 95,000 lbs.
 equivalent single wheel loading
 - no general or commercial
 non-scheduled aviation
- Myrtle Beach AFB - scheduled, commercial aircraft and
 certain charter aircraft (a commercial
 passenger aircraft with more than 10
 passengers).

- 110,000 twin wheel
- 220,000 twin tandem
- two week prior written request
- for charters

Rickenbacker AFB - civil aircraft

- two-way radio

Westover AFB - general aviation and non-scheduled air carriers

- two-way radio

B. Type of Operations

Dover AFB - use of flying facilities for

- landings
- take-offs
- movement of aircraft
- park only in area constructed by the State
- no training or practice of any kind

Eglin AFB - use of flying facilities for

- landings
- take-offs
- movement of aircraft
- park only in area leased to county
- not be used for training

Myrtle Beach AFB - use of flying facilities for

- aircraft operations (landings and take-offs)
- ground and air movements
- parking limited to areas constructed by Commission
- specifically prohibited from Air Force ramp and taxiway (west of runway 17-35)
- no training or practice of any kind or nature

Rickenbacker AFB - use airfield

- no basic flight training
 - take-offs
 - landings
- no practice movements
 - take-offs
 - landings
 - during periods of peak military traffic

Westover AFB - use flight facilities

- take-offs
- landings
- movement of aircraft
- park only in area made available and designated
- no training or practice
 - take-offs
 - landings

C. Hours and Numbers of Operations Permitted

Dover AFB	--	24 hours per day
	--	20 operations per calendar day
	--	7300 in calendar year
	---	a landing and take-off is two operations
	--	no operations when DTA personnel not present
Eglin AFB	--	24 hours per day
	--	no arrivals when civil parking reaches capacity
	--	50 operations per day
	---	takeoffs <u>or</u> landings
Myrtle Beach AFB	--	0700-2300 local
	--	initially 15 operations per weekday
	---	take-off and landing
	--	20 per weekend day
	--	5 additional operations
	---	Friday 1800-2300 local
	--	after 4 to 8 months increases to
	---	20 per weekday
	---	25 per weekend day
	---	5 additional operations
		Friday 1800-2300 local
	--	after 8 months
	---	30 per day
	--	no arrivals when civilian parking reaches capacity
Rickenbacker AFB	--	24 hour per day
	--	no restrictions on number of operations

Westover AFB -- 0700-2300 local
 -- no restriction on number of
 operations

D. Control of Ground and Air Movements

Dover AFB -- Dover control tower

Eglin AFB -- Eglin control tower

Myrtle Beach AFB -- Myrtle Beach control tower
 -- Myrtle Beach radar approach control

Rickenbacker AFB -- Rickenbacker control tower

Westover AFB -- Westover control tower

E. Fees

Dover AFB -- State may collect landing and
 other fees
 -- Reimburse USAF five dollars (\$5)
 per landing

Eglin AFB -- \$65,000 annually for maintenance
 and operations

Myrtle Beach AFB -- State may establish amount and
 collect landing fees
 -- Reimburse USAF twenty cents (\$.20)
 per 1000 lbs. maximum gross
 take-off weight of aircraft

Rickenbacker AFB -- \$150,000 annually for maintenance and operations

Westover AFB -- a sum equal to the annual total airfield operations and maintenance costs plus flight facility personnel costs times annual total of civilian operations minus annual total of civilian and military operations

F. Excluded Services

Dover AFB - Government is not responsible for

- emergency or other services
- maintenance of civil aircraft

Eglin AFB - County shall be responsible for

- emergency or other servicing
- maintenance of civil aircraft

Myrtle Beach AFB - Government is not responsible for

- emergency or routine services
- maintenance
- petroleum, oil or lubricants
- crash removal for civilian aircraft
 - however, USAF has option of crash removal at Commission expense

Rickenbacker AFB - Rickenbacker Port Authority (RPA) shall be responsible for

- emergency or other servicing
- maintenance of civil aircraft
- if Government furnishes services in an emergency, or otherwise, RPA shall reimburse

Westover AFB - Westover Metropolitan Development Corporation (WMDC) shall be responsible for

- emergency or other servicing
- maintenance of civil aircraft
- if Government furnishes services in an emergency, or otherwise, WMDC shall reimburse

G. Firefighting Services

Dover AFB - within limits of capability Government agrees to provide emergency fire fighting services involving civilian aircraft

- including but not limited to crash rescue
- no routine parking of fire equipment on airfield

- Government fire protection is subject to conditions that
 - State responsible for operation and maintenance
 - fire detection system
 - equipment and safety devices
 - ground servicing of aircraft to IAW, FAA standards
- State and operating contractor or fixed base operator must
 - execute a release and indemnification
 - specified in AFR 92-1 para 11-3 and Atch 5 (see Atch 9)
- State responsible for collection of charges
 - levied for fire fighting and rescue
 - Government has no responsibility to increase and/or maintain fire fighting capability

Eglin AFB

- within limits of capability Government agrees to provide emergency fire fighting services for civilian aircraft
 - including but not limited to crash rescue and runway foaming
 - suppressing fires in and around the civil air terminal
 - no routine parking of fire equipment on airfield
- Government may at option remove crashed civil aircraft
 - AFR 92-1 covers reimbursement

- Government fire protection is subject to conditions
 - county will comply with ADTC regulation 92-1
 - county responsible for installing, operating, maintaining
 - fire detection systems
 - equipment and safety devices
 - ground servicing of aircraft to IAW, FAA, and USAF regulations
- county personnel must be trained
 - Eglin AFB will train
- county will collect AFR 92-1 reimbursements for
 - firefighting
 - rescue
 - runway foaming
- Government has no obligation to maintain or increase capability

- Myrtle Beach AFB - within limits of capabilities
 Government will provide emergency fire fighting services to civilian aircraft including but not limited to
- crash rescue
 - runway foaming
 - suppress fires in and around civilian aircraft terminal
- Government fire protection conditions are
 - commission responsible for installing, operating, and maintaining

- fire detection equipment
 - safety devices
 - ground servicing of aircraft to IAW, FAA standards
- Commission personnel must be trained
 - Myrtle Beach AFB will train
- Commission responsible for AFR 92-1 fees for
 - fire fighting
 - rescue
 - foaming
- Government has no obligation to maintain or increase capability
- no routine parking of fire equipment on airfield
- Commission agrees to release, acquit and forever discharge all liability for use of fire fighting equipment and indemnify, defend and hold harmless all Government personnel against claims

Rickenbacker AFB - within limits of capability, Government agrees to provide emergency fire-fighting services for civil aircraft

- including but not limited to crash rescue
- suppressing fires in and around civil air terminal

- no routine parking of fire equipment on airfield
- Government may at option remove crashed civil aircraft or those obstructing
 - AFR 92-1 covers reimbursement
 - Government not liable during such removal
- Government fire protection is subject to conditions
 - RPA will comply with AFR 92-1 provisions in areas, facilities and operations
 - RPA responsible for installing, operating and maintaining
 - fire detection
 - equipment
 - safety or extinguishing devices
 - for ground servicing of aircraft to IAW, FAA, USAF standards
 - existing buildings and facilities need not be brought up to standards
 - RPA personnel shall be trained
 - RPA will reimburse USAF for
 - fire-fighting
 - rescue
 - training
 - inspection
 - other services
 - Government has no obligation to maintain or increase capacity

- Westover AFB
- within the limits of capability,
Government agrees to provide emergency
fire fighting services for civil
aircraft
 - including but not limited to crash
rescue
 - suppressing fires in and around
the civil air terminal
 - no routine parking of fire equipment on
airfield
 - Government may at option remove crashed
civil aircraft
 - AFR 92-1 covers reimbursement
 - Government fire protection is subject
to conditions that
 - WMDC comply with provisions of AFR
92-1 in areas, facilities and
operations
 - WMDC responsible for installing,
operating and maintaining
 - fire detection systems
 - equipment and safety devices
 - ground servicing of aircraft
IAW, FAA, USAF standards
 - WMDC personnel will be trained
 - Westover AFB will train
 - WMDC will collect reimbursements
levied under AFR 92-1
 - Government has no obligations to
maintain or increase capability

H. Risk of Loss and Insurance

IPAC Note: The following are verbatim extracts of the agreements.

EXTRACT

*** * * * ***

Dover AFB - The State agrees to assume all risk of loss or damage to property or injury to or death or persons by reason of civil aviation use of Dover under this agreement, including risks connected with the provision of services or goods by the Government to the State or to any user under this agreement. The State further agrees to indemnify and save harmless the Government against, and to defend at State expense, all claims for loss, damage, injury, or death sustained by any individual or corporation and arising out of or in any way connected with civil use of Dover pursuant to or in connection with this agreement, or arising out of the provision of services or goods by the Government to the State or to any user in connection with this agreement whether the claims be based in whole or in part on the negligence or fault of the Government or its contractors or any of their officers, agents, and employees, or based on any concept of strict or absolute liability, or otherwise.

b. The State agrees that it will carry a policy of liability and indemnity insurance satisfactory to the said officer to protect the Government against any of the aforesaid losses and/or liability, in the sum of not less than six (6) million dollars bodily injury and property damage combined for any one accident subject to periodic

review at the request of either party hereto, not more frequently than once each year, and which amount shall be changed only by mutual agreement of both parties hereto, with final authority for agreeing to such change being vested in the Delaware Transportation Authority for the State, and the said officer for the Government.

Eglin AFB - The County agrees to assume all risk of loss or damage to property or injury to or death of persons by reason of civil aviation use of Eglin under this agreement, including risks connected with the provision of services or goods by the Government to the County or to any user under this agreement. The County further agrees to indemnify and save harmless the Government against, and to defend at County expense, all claims for loss, damage, injury, or death sustained by an individual or corporation and arising out of or in any way connected with the County's use of Eglin pursuant to or in connection with this agreement, or arising out of the provision of services or goods by the Government to the County or to any user, whether the claims be based in whole or in part on the negligence or fault of the Government or its contractors or any of their officers, agents and employees, or based on any concept of strict or absolute liability, or otherwise.

b. The County agrees that it will carry a policy of liability and indemnity insurance satisfactory to the ADTC Commander, Eglin AFB, to protect the Government against any of the aforesaid losses and/or liability, in the sum of not less than three (3) million dollars bodily injury and property damage combined for any one accident, subject to periodic review at the request of either party hereto, not more frequently than once each year, and which amount shall be changed only by mutual agreement of both parties hereto,

with final authority for agreeing to such change being vested in Okaloosa County Board of Supervisors for the County, and the ADTC Commander, Eglin AFB, for the Government.

Myrtle Beach AFB - The Commission agrees to assume all risks of loss or damage to property, and injury or death to persons by reason of civil aviation use of Myrtle Beach Air Force Base under this agreement, including risks connected with the furnishing of services or goods by the Government to the Commission or to any other user under this agreement. The Commission further agrees to indemnify, save, and hold harmless the Government of the United States, and to defend the Government of the United States at Commission expense against all claims for loss, damage, injury or death sustained by any individual or corporation arising out of or in any way connected with civilian use of Myrtle Beach Air Force Base pursuant to or in connection with this agreement, or arising out of the furnishing of services or goods by the Government to the Commission or any user in connection with this agreement, whether or not the claim be based in whole or in part on the negligence or fault of the Government or its contractors or any of their officers, agents, and employees or based on any concept of strict or absolute liability or otherwise.

b. The Commission agrees that it will carry a policy of liability and indemnity insurance satisfactory to the Government in an amount not less than \$3,000,000 per accident, to protect the Government against any of the aforementioned losses or liabilities. The amount and type of insurance provided for in this paragraph shall be subject to a periodic review at the request of either party to this agreement not more than once per calendar year at

which time the parties to this agreement may mutually agree to change the amount and type of insurance as may be appropriate under the circumstances at that time.

c. The Commission recognizes that Myrtle Beach Air Force Base and Air Force operations therefrom are a part of the Tactical Air Command, and, as such, aircraft operating from Myrtle Beach Air Force Base are Tactical fighter aircraft armed with live ammunition and explosives, including but not limited to 2.75 inch folding fin aircraft rockets, 20 millimeter target practice ammunition, 20 millimeter high explosive incendiary ammunition, Mark 82 five hundred pound general purpose bombs, BLU 27 seven hundred fifty pound fire bombs, and AIM-9 intercept missiles. The Commission also recognizes that the aforementioned explosives are dangerous instrumentalities and that operations involving such explosives will be conducted in the vicinity of the proposed civilian aircraft terminal, and the Commission further agrees that all of the aforementioned provisions of paragraph 9a and 9b are applicable and apply to loss, damage, injury or death caused by such high explosives and their use.

Rickenbacker AFB - RPA agrees: a. To indemnify and hold harmless the Government against and to defend, at RPA expense, all claims for loss, damage, injury, or death sustained by any individual or corporation and arising out of or in any way connected with civil aviation or otherwise with RPA's use of Rickenbacker pursuant to or in connection with this agreement, or arising out of the provision of services or goods by the Government to RPA or to any user, whether the claims be based in whole or in part on the negligence or fault of the Government or its contractors or any of their officers, agents and employees, or based on any concept of strict or absolute liability, or otherwise. RPA further agrees to indemnify and hold harmless the

Government against and to defend, at RPA expense, all claims for damage or injury to persons or property or actions for injunctive relief or declaratory judgment, by whatever style, arising from ground operations or overflight (including side-slant impacts) by civil aircraft, to include hearing loss claims, noise or vibration damage, economic losses to farms, businesses, etc., nuisance actions, and inverse condemnation or similar claims of "taking" or other diminishment in value or enjoyment of property associated with civil aircraft movements at, to, or from the Airfield.

b. That it will carry a policy of liability and indemnity insurance satisfactory to the Government, and by a company satisfactory to the Government, to protect the Government against any of the aforesaid losses and/or liability in the sum of not less than ten (10) million dollars bodily injury and property damage or loss combined for any one accident or incident, subject to periodic review at the request of either party hereto not more frequently than once each year, and which minimum amount shall be changed only by mutual agreement of both parties hereto, with final authority for agreeing to such change being vested in the Chairman for RPA, and Commander, Rickenbacker Air National Guard Base, Ohio, for the Government. To the extent insurance is not reasonably economically available on certain of the liabilities above, RPA will self-assume the risk.

Westover AFB - WMDC agrees: a. To assume all risk of loss or damage to property or injury to or death of persons by reason of civil aviation use of Westover under this agreement, including risks connected with the provision of services or goods by the Government to WMDC or to any user under this agreement. WMDC further agrees to indemnify and

hold harmless the Government against, and to defend at WMDC expense, all claims for loss, damage, injury, or death sustained by any individual or corporation and arising out of or in any way connected with WMDC's use of Westover pursuant to or in connection with this agreement, or arising out of the provision of services or goods by the Government to WMDC or to any user, whether the claims be based in whole or in part on the negligence or fault of the Government or its contractors or any of their officers, agents and employees, or based on any concept of strict or absolute liability, or otherwise.

b. That it will carry a policy of liability and indemnity insurance satisfactory to the Government to protect the Government against any of the aforesaid losses and/or liability, in the sum of not less than six (6) million dollars bodily injury and property damage combined for any one accident, subject to periodic review at the request of either party hereto, not more frequently than once each year, and which amount shall be changed only by mutual agreement of both parties hereto, with final authority for agreeing to such change being vested in a vote by the Board of Directors for WMDC, and the 439th TAW Commander, for the Government. The final authorities referred to in paragraph 8b, may be changed by giving a 15 day written notice via certified mail to the respective parties if a change is mandated by the Secretary of the Air Force or duly qualified vote of the WMDC.

* * * * *

END EXTRACT

I. Control of Wildlife

- Dover AFB** - **USAF is not liable for damage,
destruction, injuries or death**
 - resulting from bird or wildlife
collision**

- Eglin AFB** - **Government is not responsible for the
control of wildlife**
 - birdstrikes**

- Myrtle Beach AFB** - **not addressed**

- Rickenbacker AFB** - **not addressed**

- Westover AFB** - **Government is not responsible for the
control of wildlife**
 - birdstrikes.**

J. Compliance With Air, Noise and Water Pollution Standards

- Dover AFB** - **State will comply with USAF, state or
local government agencies standards for
control of**
 - air, water or noise pollution**
 - solid waste disposal**
- **dust, erosion, or nuisance**
 - will be corrected by State using
USAF procedures**

- Westover AFB - WMDC will comply with requirements of
USAF, Federal, state or local
governmental agencies for control of
-- air, water or noise pollution
-- hazardous or solid waste disposal
- dust, erosion, or nuisance
-- will be corrected by WMDC using
standard engineering methods and
procedures

K. Conflicts Between Military Operations and Civilian Operations

- Dover AFB - First come, first served except
-- exercises
-- contingencies
-- military exigencies
- Eglin AFB - government or mission essential have
priority
- Myrtle Beach AFB - government or mission essential have
priority
- Rickenbacker AFB - government or mission essential have
priority
- Westover AFB - government or mission essential have
priority

L. New Construction

Dover AFB - siting and construction plans will be coordinated with USAF prior to commencement of construction

Eglin AFB - future construction of runways, taxiways, aprons
-- comply with TT265 loading

Myrtle Beach AFB - prior to any civilian operation, Commission will construct
-- adequate aircraft parking facilities
-- taxiway from terminal to runway
-- automobile parking
-- adequate electrical power
-- adequate water and sewage facilities
-- access road to terminal from county road
-- adequate security fencing
- plans, specifications and construction schedules approved by Commander, 345th TFW

Rickenbacker AFB - future runways, taxiways or parking aprons will be constructed to USAF standards
-- with USAF incurring additional cost
-- restriction waived if no MCP money available

- construction plans must be approved by Rickenbacker AFB Commander
- RPA may enter airfield or navigation easement area to maintain or improve airfield
 - major projects require base and RPA approval

- Westover AFB
- future runways and primary taxiways will be designed by WMDC to meet USAF requirements
 - construction plans must be coordinated with USAF

M. Existing Facilities

- Dover AFB
- airfield pavements used on "as is, where is" basis
 - in easement and State owned areas State responsible for
 - maintenance of pavements, equipment, and facilities
 - snow removal
 - cleaning fuel spills
 - hazardous waste accidents
 - control of foreign object damage
 - in accordance with FAA standards

- Eglin AFB
- Government owned airfield pavements available for use on "as is, where is" basis
 - in leased areas, county is responsible for maintenance of

- pavements
- equipment
- lighting
- facilities
- road and railroad crossings
- taxiway with lights and markings
- control of foreign object damage materials
- Government is willing to negotiate a maintenance contracts for above services

Myrtle Beach AFB - airfield pavements available on "as is" basis

- maintenance, resurfacing and repairs of leased pavement is the responsibility of the Commission
- repairs and work must control foreign object damage

Rickenbacker AFB - airfield pavements made available on "as is, where is" basis

- Government snow removal will be limited to
 - main runway
 - connecting and parallel taxiways
 - as required for USAF mission

Appendix 2.1 The Impact of Deregulation on Route and Airport Selection

2.A.1 Background

From 1938 until 1978, the integration of air services into a national air transportation system was handled by the U.S. Civil Aeronautics Board (CAB). In very simplified terms the pattern of industry development, under CAB regulation, can be described as follows:

As the trunk airlines - those initially licensed by the CAB in the late 1930's - gradually acquired larger, longer range aircraft (DC-3's to DC-6's, etc.), the CAB permitted these carriers to serve the longer haul routes best suited to the new aircraft. As the shorter haul routes were abandoned by the trunks, the CAB authorized local service or "feeder" airlines to serve the routes operating the used equipment no longer utilized by the trunks. Over time, as feeders acquired larger hand-me-down equipment and routes, the CAB permitted third-level carriers (air taxis) to provide service to points too small for, or otherwise unserved by, the larger airlines. Today's U.S. commuter airlines are the direct descendants of these third-level carriers.

CAB integrated the services of these three levels of carriers into a national air transportation system by awarding routes to trunks and feeders. (Third-level carriers operating small aircraft were generally exempt from CAB route and rate regulation.) CAB conveyed that the trunk airlines would carry the vast majority of enplaned passengers between major traffic generating points. Passengers originating in and/or destined to smaller cities would be transported in and out of the trunk system by second level carriers. Third level carriers could then fill any gaps, on the condition that they did so with

small equipment. If an airport wanted to obtain new service, it had to convince the CAB that such service was necessary and would serve the public interest.

When the Airline Deregulation Act of 1978 eliminated CAB's authority over entry, each airline was free to choose the routes it wished to serve. As a result, the artificial three-level structure imposed on the industry began to change. Former second-tier (local service) airlines such as U.S. Air and Piedmont rapidly expanded into direct competition with trunks and thus stopped feeding passengers to the trunks. Instead, they carried an increasing proportion of the traffic from origin to ultimate destination. After some delay and regrouping, the trunk carriers (e.g. United, American, TWA, etc.) began to compete head-to-head with the expanding local service airlines in order to gain access to feeder traffic sources and to protect their existing markets.

Service by former trunks and local service carriers shifted from essentially linear routes, to hub and spoke route systems, which has heightened the importance of, and competition for, traffic to support the hubs. As the number of hub and spoke systems has grown and competition for traffic has intensified, larger airlines have acquired other carriers to provide them access to additional traffic. In low density markets, which larger carriers cannot economically serve with their own aircraft and cost structures, larger airlines have acquired or affiliated with commuter airlines. This has led to the development of a number of national or international transportation systems which can provide end-to-end, on-line service for the traveling public.

Thus, in the brief period between 1978 and 1985, a national air transportation system formerly orchestrated by the CAB has been replaced by a series of competitive, market-integrated air

carrier systems organized around major U.S. airlines, their hub, and spoke systems.

2.A.2 Combination Carrier Service Patterns

The post-1978 period witnessed a fundamental shift in air service patterns. The most obvious change in airline route structures, and subsequently service patterns, has been the rapid growth in hubbing operations by major U.S. airlines. (Table 2-A).

Hubbing is a process by which airlines operate in and out of selected airports in banks of arrivals and departures. Hubbing allows passengers to move conveniently, with minimum delay between connecting flights, on the same carrier. The key to a hubbing operation is collecting large volumes of passengers from many points, and flowing them through a common hub, enabling them to transfer to connecting flights.

By channeling passengers through an intermediate connecting hub, an airline can combine passengers with different origins and destinations, increasing both the number of city-pairs served (Figure 2-A) and the average number of passengers per flight, while reducing average costs. The reorienting of carrier route systems around hubs has led to distinct shifts in the pattern of flights. Examples of hubbing are discussed at the end of this Appendix. With freedom to enter and leave routes, and with the widespread adoption of hub and spoke strategies, the best guarantee of good airline service has been to become the site of a major hub.

TABLE 2-A
THE GROWTH OF HUBBING

Airline	Leading Hub city in 1983	Percent of airline's domestic departures at hub		Percent change in departures at hub
		1978	1983	
American	Dallas-Ft. Worth	11.2	28.6	113.7
U.S. Air	Pittsburgh	16.0	23.2	45.7
Continental ^{a/}	Houston	12.8	22.9	45.8
Delta	Atlanta	18.3	21.4	11.4
Eastern	Atlanta	18.3	21.0	1.0
Frontier	Denver	18.0	33.8	23.8
Northwest ^{b/}	Minneapolis-St. Paul	16.1	20.7	18.7
Ozark	St. Louis	15.5	35.6	53.7
Pan American ^{c/}	New York	12.3	12.1	(1.8)
Piedmont	Charlotte	3.7	19.6	583.0
Republic ^{d/}	Minneapolis-St. Paul	3.4	7.7	91.1
TransWorld	St. Louis	11.9	33.0	81.3
United	Chicago	13.8	18.9	1.5
Western	Salt Lake City	10.3	16.9	129.3

Source: Service Segment Data taken from CAB Report to Congress on Implementation of Deregulation Act

^{a/} Continental and Texas International departures were combined for 1978

^{b/} There was a strike at Northwest in the second quarter of 1978. Therefore in both years data for service during the first quarter are reported.

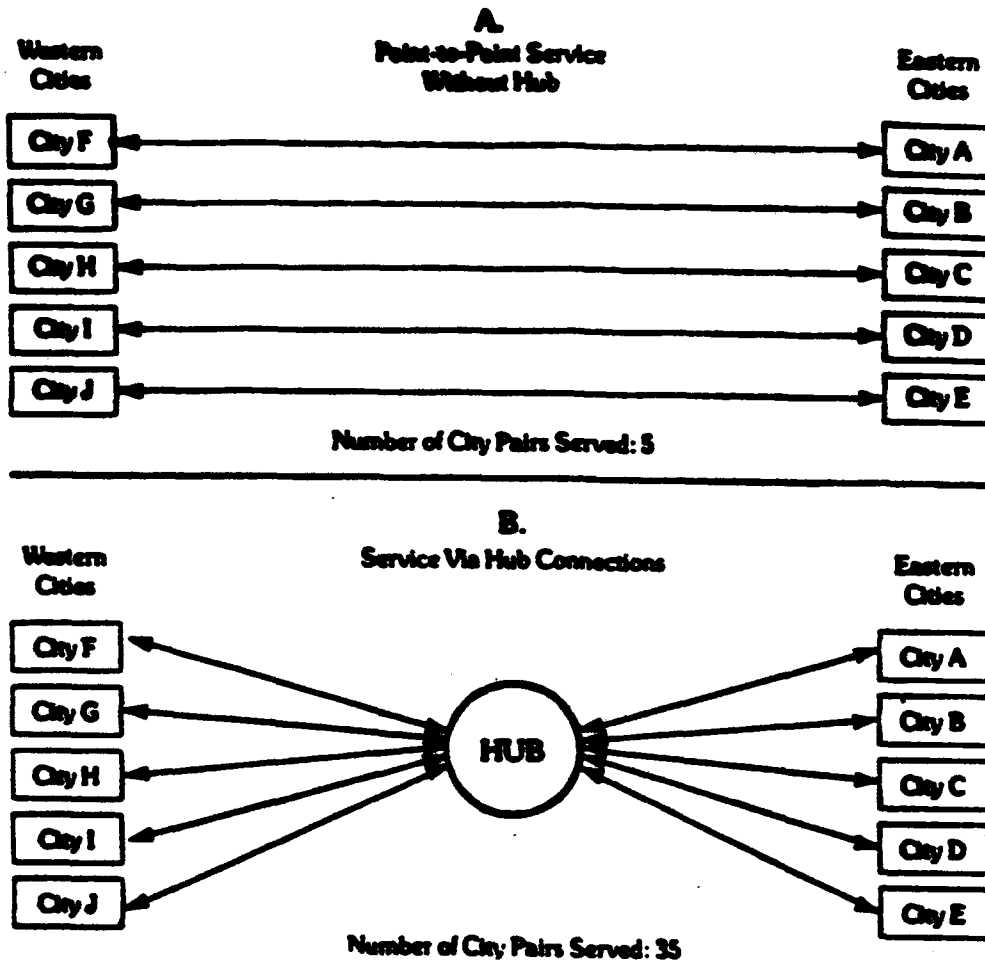
^{c/} National and Pan American departures were combined for 1978.

^{d/} North Central, Southern, and Hughes Airwest departures are combined for 1978.

Source: Bailey, Graham, and Kaplan, Deregulating the Airlines, MIT Press 1985, p. 79.

Figure 2-A

Demonstration of Leverage of Hub Connections



Source: Brenner, Leat, Schett, Airline Deregulation, Eno Foundation, 1985, p. 83

2.A.3 Hub and Spoke Systems

The elimination of Federal entry restrictions coupled with the underlying economics of hub and spoke systems has heightened the importance of, and competition for, traffic to support the hub operation. To increase the effectiveness of their hubs, major carriers have aggressively sought new traffic sources. Some carriers, such as American and Delta, have chosen to grow internally. Others such as Northwest, TWA, United and Texas Air have sought growth through the acquisition of other airlines. But major carrier costs and/or equipment often effectively preclude service to low density markets proximate to the hub. Thus major carriers have increasingly affiliated with or acquired commuter carriers to gain access to traffic from low density markets.

The combined impacts of hubbing and increased industry consolidation on the prospects of joint use for Scott AFB are difficult to predict with precision. Based on conversations with TWA, and on the study team's analysis, TWA's pending acquisition of Ozark is not anticipated to significantly reduce congestion at Lambert. TWA has been constrained from expanding its level of operations at Lambert by a lack of smaller (DC-9, 737) aircraft. Acquisition of Ozark's DC-9 fleet will permit TWA to use its larger aircraft in markets now served by both carriers while redeploying the smaller aircraft into new markets or more frequent service in existing markets.

In either case, a reduction in the number of operations is not anticipated by the combined carrier. Indeed, it is possible that the merger will result in more intensive utilization of the combined fleet by substituting new cities for those presently served by both carriers, thereby facilitating a more efficient allocation of aircraft and crews.

The prospects of another airline establishing a hub in the St. Louis area are probably not enhanced by the consolidation of the industry. Recent acquisitions by Texas Air and Northwest already give them access to nearby hubs (Kansas City and Memphis) whose viability would be diminished if they established an additional hub in St. Louis. American is unlikely to re-establish a St. Louis hub since it already has a major hub at Chicago and new hubs in Nashville and Raleigh-Durham. Delta is committed to hubs in Atlanta, Dallas and Cincinnati. Piedmont and U.S. Air might have acquired Ozark to get a St. Louis hub but are unlikely to start a new hub there.

Perhaps the best prospect for establishing a new St. Louis hub would be a low cost carrier (such as Southwest Airlines), which could use its low cost/low fare strategy against the higher cost services of TWA/Ozark. But even if a new entrant were to hub in the St. Louis region, Lambert would almost certainly be its first choice airport due to Lambert's location, well-established identity with passengers, and the added attractiveness to passengers, and consequently to airlines, of having access to "back-up" flights on other airlines.

As the economic development of Southwestern Illinois progresses and awareness of the joint use of Scott AFB spreads, however, the prospect of superior access to a significant number of travellers will provide a strong incentive for the airlines to operate spokes into Scott AFB from their existing hubs.

The location of a secondary airport, with respect to both the primary airport and to existing and projected traffic pools, is also an important consideration for airlines in evaluating secondary airports. For example, Hobby and Intercontinental at Houston are on opposite sides of a

sprawling metropolitan area, as are Newark and La Guardia in New York. Thus, both Newark and Hobby were considered "good bets" for attracting passengers, due to their relative convenience for travelers. A comparison of multiple airport cities is included in Table 2-B.

A number of special considerations also affect airline decisions regarding secondary airports. These include:

- o Unusually high travel demand sources (e.g. government travel at Washington National and Dulles Airports, and gambling at Las Vegas);
- o Strong local point-to-point markets (e.g. Oakland to Los Angeles, San Francisco to Burbank and Ontario);
- o Airport constraints at a primary airport (e.g. Washington National);
- o The need to match service by key competitor(s) (e.g. Delta and Eastern to and from Atlanta);
- o Availability and cost of ground and passenger handling services, and terminal facilities, for instance, at the secondary airport (e.g. Midway vs. O'Hare);
- o For cargo operators, the ability to conduct nighttime operations.

2.A.31 Examples of Hubbing

A successful hub does not require a large regional population base. In 1983, for example, Charlotte, N.C. enplaned 1.24 percent of U.S. total enplanements with only 0.40 percent of the population base (see Figures 2-B and 2-C). Philadelphia, on the other hand had 1.28 percent of the U.S. total enplanements with 2.03 percent of the population base. Figures 2-D and 2-E show a comparison of the enplaned passenger growth versus SMSA population growth and aircraft operations growth.

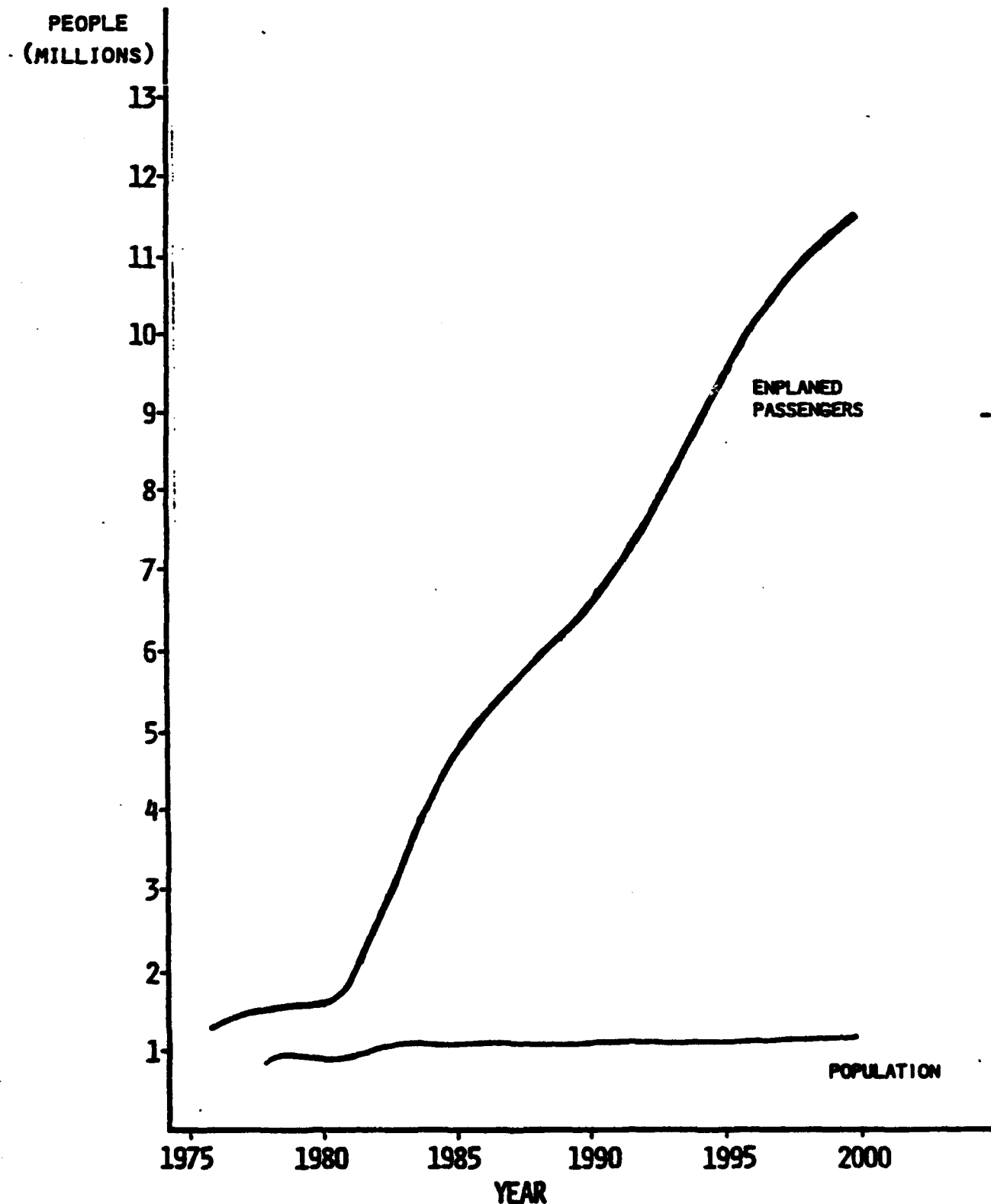
TABLE 2-B
HUB COMPARISONS
1963 Airport Data

HUB	Number of Airports	Air Carrier Airports	Enplaned Passengers (000)				Enplaned Cargo and Mail (Tons)	Aircraft Operations (000)				
			Air Carrier	Taxi	Commuter	Total		Air Carrier	Air Taxi/Commuter	GA	MHI	Total
St. Louis	16	Lambert	7,528	2	96	7,626	69,576.14	208	43	85	8	337
Houston	18	Intercontinental Hobby	6,225 2,659	21 29	157 15	6,403 2,713	52,977.83 1,810.96	186 89	68 17	76 198	1 1	331 305
		HOUSTON TOTAL	8,894	50	172	9,116	54,788.79	275	85	274	2	637
Atlanta	19	Hartsfield	18,600	0	210	18,811	243,893.70	486	72	35	5	597
Bellingham, Wash.	52	BFW Regional Leve Field	12,435 2,927	1 3	425 0	12,861 2,930	136,808.83 217.00	317 94	87 31	22 172	1 1	427 259
		DALLAS TOTAL	15,362	4	425	15,791	137,025.83	411	118	194	2	726
Chicago	27	O'Hare Midway Meigs Gary, Indiana CHICAGO TOTAL	18,384 737 17 0 19,138	2 2 1 0 5	730 0 5 0 735	19,116 739 23 0 19,878	414,655.36 3,122.85 26.50 0 417,804.71	481 33 0 0 514	126 32 4 3 165	48 122 54 30 254	4 3 1 0 8	659 191 59 33 942
Washington	-	Bullies International	1,346	1	22	1,369	23,868.56	38	15	65	4	122
Baltimore	-	Washington National Balt/Wash International BALT/MSH TOTAL	6,455 2,324 10,125	3 0 4	347 282 651	6,804 2,607 10,780	42,680.50 28,898.45 95,447.52	185 99 322	59 57 131	83 74 222	0 2 6	122 327 681
San Francisco	29	SF International	11,113	2	157	11,273	223,758.67	231	65	49	3	348
Oakland		Oakland International	1,449	2	15	1,466	6,258.86	48	38	130	1	217
San Jose		San Jose	1,688	1	20	1,709	6,353.27	50	17	145	1	212
		SAN FRANCISCO TOTAL	14,250	5	192	14,448	236,370.80	329	120	324	5	777
Charlotte	23	Douglas	3,483	5	83	3,571	30,420.06	134	59	82	5	280
Memphis	-	Memphis International	2,330	1	82	2,413	27,550.13	130	42	110	3	206
Dayton	-	Cox International	1,097	0	43	1,140	7,038.82	52	35	43	1	131

Sources: FAA/CAB Airport Activity Statistics
FAA Terminal Area Forecasts
FAA Aviation Forecasts
U.S. Census Bureau
Sales and Marketing Management Surveys

Figure 2-B

CHARLOTTE, N.C. (SMA)
DOUGLAS MUNICIPAL



SOURCE: POPULATION/INCOME, BUREAU OF ECONOMIC ANALYSIS
ENPLANED PASSENGERS, TERMINAL AREA FORECASTS, FAA

Figure 2-C

CHARLOTTE, N.C.
DOUGLAS MUNICIPAL

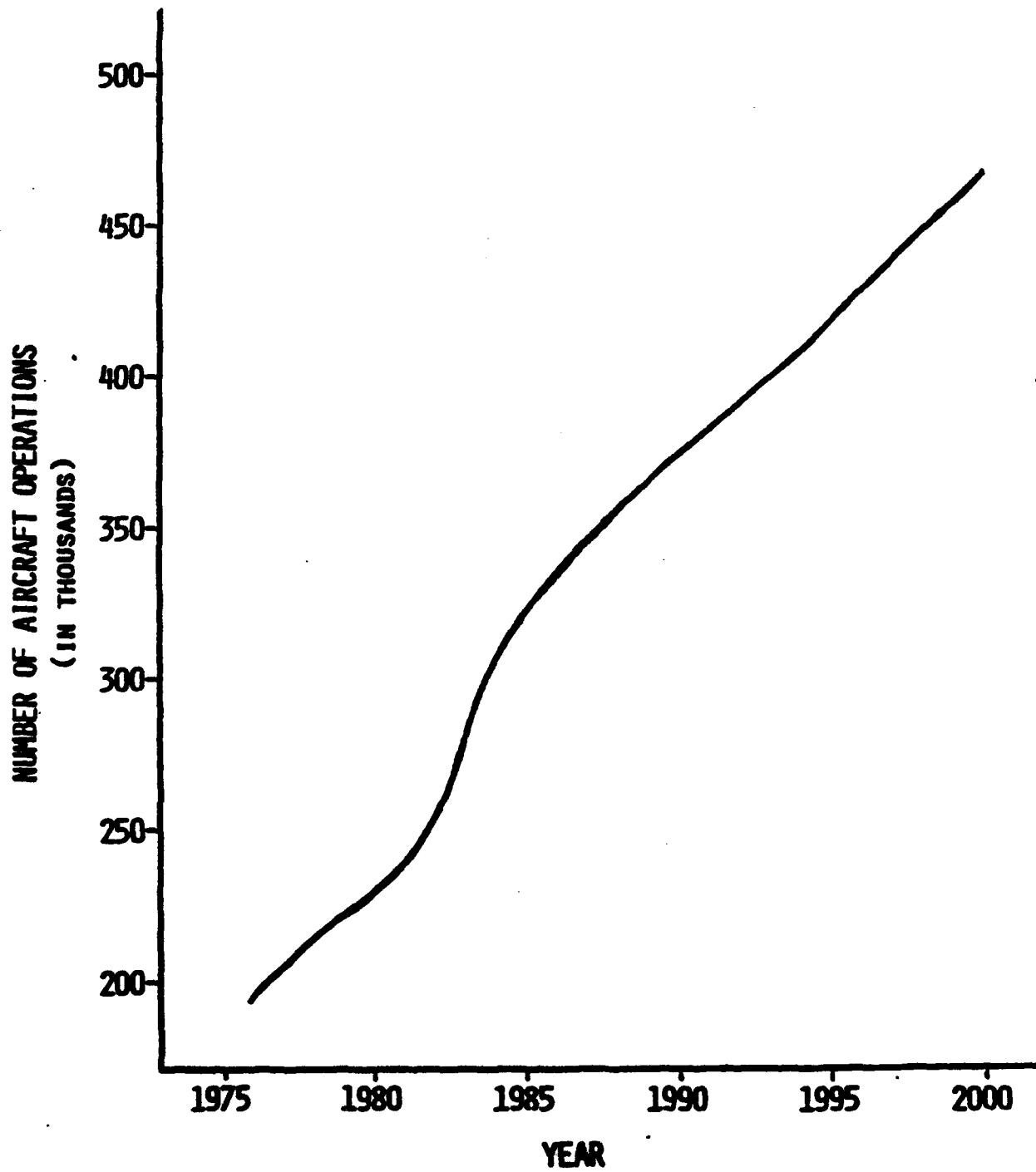
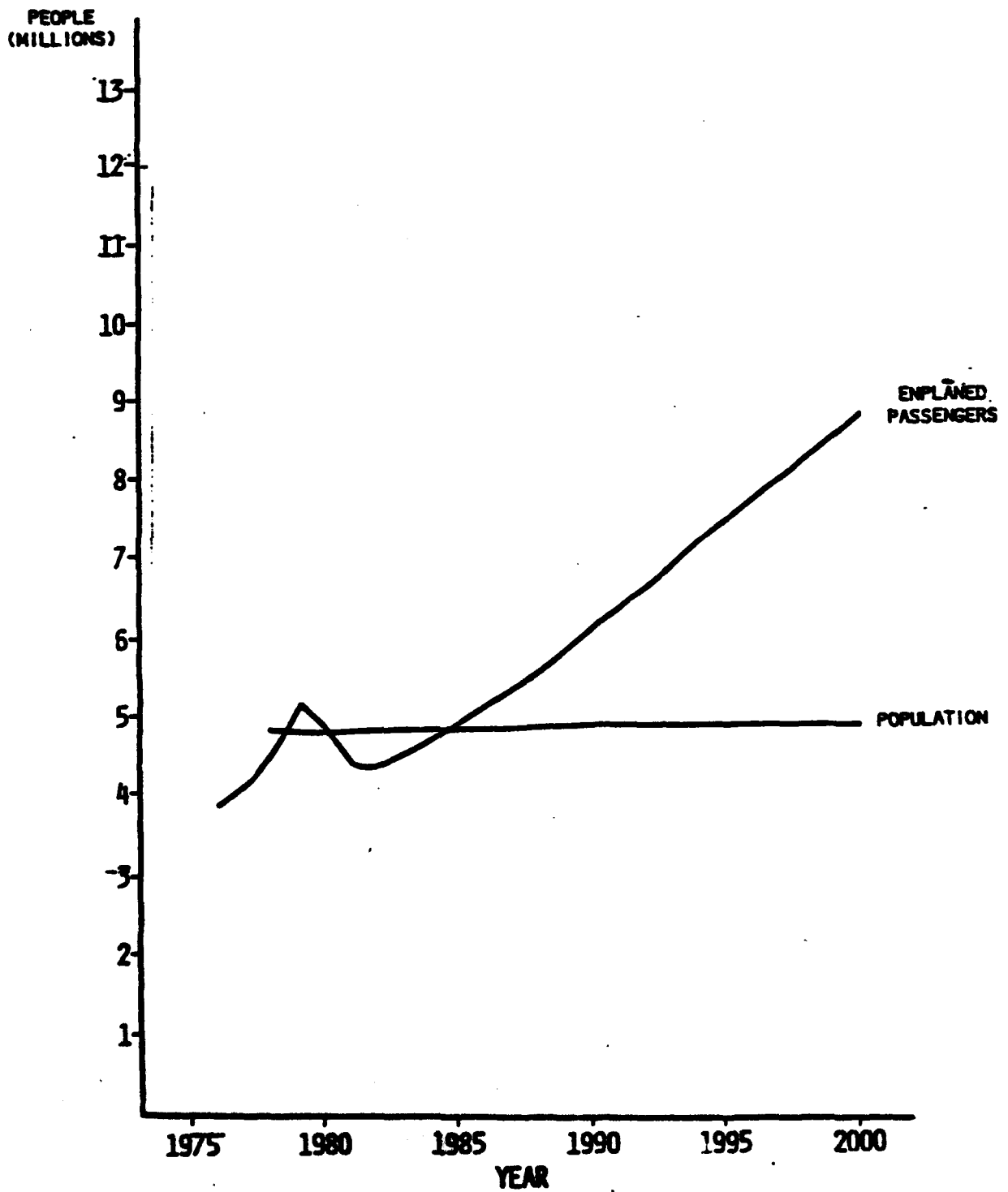


Figure 2-D

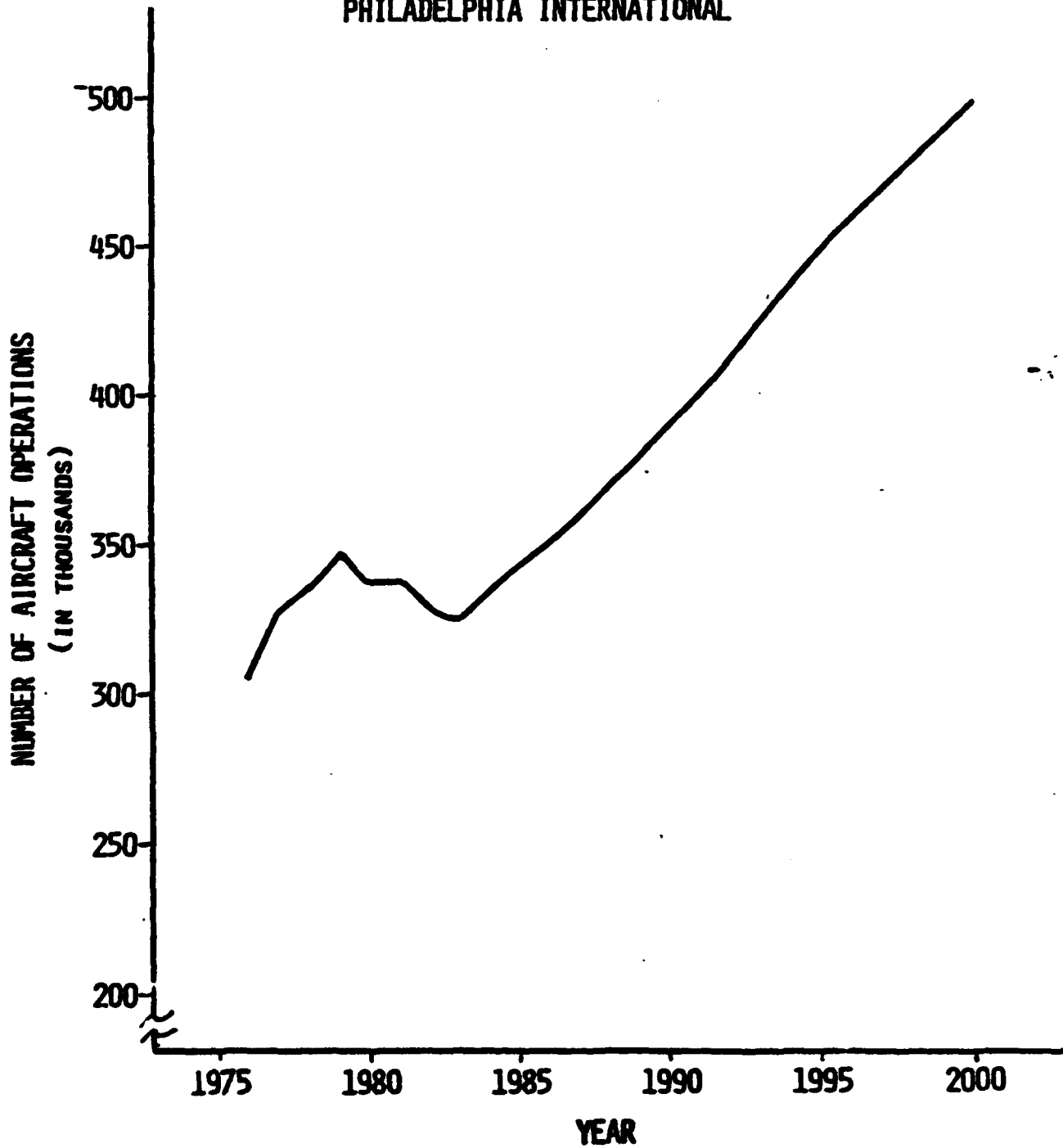
PHILADELPHIA INTERNATIONAL



SOURCE: POPULATION/INCOME, BUREAU OF ECONOMIC ANALYSIS
ENPLANED PASSENGERS, TERMINAL AREA FORECASTS, FAA

Figure 2-B

PHILADELPHIA INTERNATIONAL



SOURCE: AIRCRAFT OPERATIONS, TERMINAL AREA FORECASTS, FAA

St. Louis/Lambert provides an excellent example of the economic advantages of hubbing which have led to the widespread adoption of hub and spoke systems by U.S. airlines.

Figure 2-F is a selected TWA flight matrix of the St. Louis hub which illustrates the wave or bank effect of TWA flights moving through the connecting complex at the St. Louis hub and on to their ultimate destinations. It clearly shows the process by which airlines group and "time-compress" the arrival and departure times of flights at their hubs. Figures 2-G and 2-H illustrate this grouping more vividly, by showing the connecting flight departure times of two selected flights from Chicago. TWA 199 and 155 illustrate the synergistic effect of the hubbing process. In the case of TWA 155, a wave which provides connections for 7:00 a.m. departures from west coast airports is evident, although not fully developed. There are definitely positive aspects of the hubbing process for passengers and the competitive position of the airlines; however hubs tend to cause airport peak hour congestion problems. Figure 2-I shows the arrival and departure of TWA and Ozark flights during early to mid-morning hours. Even under good conditions, these are extremely tight flow patterns. Seventy-three takeoffs and landings in 30 minutes, even under optimum weather conditions is difficult.

Ozark's operating pattern at St. Louis is similar. A passenger can fly Ozark Airlines from the Chicago area to 42 destinations, but only St. Louis is served non-stop. Of 50 total destinations served from Chicago, TWA serves only five on a non-stop basis compared to 56 non-stop destinations served through St. Louis.

Figure 2-F

SELECTED TWA FLIGHT
MATRIX OF ST. LOUIS HUB

<u>Flight</u>	<u>Origination</u>		<u>St. Louis Hub</u>		<u>Destination</u>
			<u>Arrive</u>	<u>Depart</u>	
457	Washington National	6:50 am	7:45 am	9:05 am	Denver
443	Philadelphia	6:50 am	8:00 am	9:10 am	Los Angeles
141	Kansas City	7:15 am	8:05 am	8:50 am	Little Rock
223	New York Newark	6:45 am	8:07 am	9:10 am	San Francisco
199	Chicago	7:00 am	8:08 am	8:45 am	San Diego
73	New York LaGuardia	6:40 am	8:12 am	8:40 am	Tulsa
496	Kansas City	8:05 am	9:02 am	9:55 am	Miami
484	Omaha	8:00 am	9:06 am	9:50 am	Milwaukee
342	Kansas City	8:10 am	9:07 am	9:55 am	Norfolk
478	Chicago	8:05 am	9:10 am	9:45 am	Tampa
228	Ontario	7:00 am	12:29 pm	1:45 pm	Dayton
224	San Francisco	7:00 am	12:42 pm	1:35 pm	Detroit
756	Los Angeles	7:15 am	12:45 pm	1:50 pm	Philadelphia
114	San Jose	7:00 am	12:52 pm	1:40 pm	New York LaGuardia

Source: TWA Flight Guide Oct. 1-26, 1985

Figure 2-G
MATRIX OF TWA SPOKES
FLIGHT 199

<u>Flight</u>	<u>Origination</u>	<u>St. Louis Hub</u>			<u>Destination</u>
		<u>Arrive</u>	<u>Connect With</u>	<u>Depart</u>	
199	Chicago	7:00 am	8:08 am	255	Dallas/Ft. Worth
				7051	Joplin
				563	Las Vegas
				307	New Orleans
				199	San Diego
				71	San Jose
				7041	Springfield, Mo.
				7021	Columbia, Mo.
				7021	Lake of the Ozarks
				141	Little Rock
				279	Omaha
				429	Ontario, Canada
				169	Phoenix
				73	Tulsa
				359	Austin
				359	Houston
				746	Kansas City
				95	Oklahoma City
				29	Seattle
				425	Wichita
				153	Albuquerque
				457	Denver
				443	Los Angeles
				223	San Francisco

24 Destinations

Source: TWA Flight Guide Oct. 1-26, 1985

Figure 2-H

MATRIX OF TWA SPOKES
FLIGHT 155

<u>Flight</u>	<u>Origination</u>	<u>St. Louis Hub</u>			<u>Destination</u>
		<u>Arrive</u>	<u>Connect With</u>	<u>Depart</u>	
155	Chicago	9:45 am	10:48 am	7011	Lake of the Ozarks
				7045	Springfield, Mo.
				7023	Columbia, Mo.
				7053	Joplin
				419	Las Vegas
				123	Albuquerque
				561	Denver
				131	Oklahoma City
				509	Phoenix
				155	Tucson
				27	Tulsa
				489	Little Rock
				273	Colorado Springs
				91	Los Angeles
				221	San Antonio
				177	San Francisco
				405	Wichita
				451	Austin
				451	Dallas/Ft. Worth
				525	Houston
				259	Omaha
				245	Salt Lake City
				7032	Carbondale, Ill.
				335	Des Moines
				168	Atlanta
				20	Nassau/Freeport
				528	Pittsburgh
				892	Washington National
				208	Memphis
				406	Nashville
				590	Baltimore
				30	Louisville
				18	San Juan, P.R.

33 Destinations

Source: TWA Flight Guide Oct. 1-26, 1985

Figure 2-I

St. Louis
Only Clark and TWA Arrivals and Departures

7:00	7:30	8:30	9:30
7:00	7:30	8:30	9:31
7:00	7:40	8:35	9:32
7:00	7:42	8:43	9:32
7:00	7:45	8:45	9:40
7:00	7:45	8:45	9:40
7:00	7:45	8:45	9:40
7:00	7:47	8:45	9:40
7:00	7:50	8:45	9:40
7:00	7:51	8:45	9:40
7:00	7:53	8:45	9:40
7:00	7:54	8:45	9:44
7:20	7:55	8:45	9:45
7:24	7:55	8:45	9:45
	7:55	8:45	9:45
	7:56	8:45	9:45
	7:57	8:45	9:45
	7:57	8:45	9:45
	7:57	8:45	9:50
	7:58	8:47	9:50
	7:59	8:47	9:50
	8:00	8:50	9:50
	8:00	8:50	9:50
	8:00	8:50	9:50
	8:00	8:50	9:50
	8:00	8:50	9:50
	8:00	8:50	9:50
	8:04	8:50	9:50
	8:04	8:50	9:53
	8:04	8:50	9:53
	8:05	8:50	9:53
	8:05	8:50	9:53
	8:05	8:50	9:53
	8:05	8:50	9:53
	8:07	8:55	10:00
	8:07	8:55	10:00
	8:07	8:55	10:00
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		9:25	

73

1978 14 17 17 1978

* - 179 T.O or Landings in 130 minutes with 73 of those in 30 minutes

**Appendix 2.2
Survey Results**

AMERICAN

Type:	Major
Scope:	Domestic: Nationwide International: Europe, Mexico, and Caribbean
Hubs:	Dallas/Fort Worth Chicago Nashville (April 1986) Raleigh-Durham (1983) Denver is under consideration.
Aircraft Types:	DC-10 B-767 B-727 MD-80
Local Operations:	Several daily nonstop flights to its existing hubs.
Objectives:	Compete for feed traffic now flowing over St. Louis by serving behind St. Louis points from one or more of AA's existing gateways; expanding use of affiliated commuters (American Eagle) to serve smaller communities.
Operating Requirements:	Lambert facilities are adequate; delays are a problem.
Contacts:	Identities withheld by request.

EASTERN

Type: Major

Scope: Domestic: Nationwide
International: Mexico, Central America,
Caribbean, S. America, Canada, and Europe
(London, Madrid)

Hubs: Atlanta
Miami
Kansas City
Probably needs a mid-Atlantic hub.

Aircraft Types: DC 10-30
L1011
B-757
A-300
B-727
DC-9

Local Operations: Service at STL is limited to flights connecting
at EAL's existing hubs.

Objectives: Lower costs; if acquisition by Texas Air is
approved, will need to rationalize the route
systems and service patterns with Continental
and New York Air.

Operating Requirements: Limited facilities requirements at STL due
to the low level of operations there.

Contacts: Daniel Klein, Vice President, Strategic Planning
Peter Murray, Director, Strategic Planning

FEDERAL EXPRESS

Type: All-cargo, small package

Scope: U.S., Canada, Europe and Asia (1987)

Hubs: Memphis is the major hub.
Newark is a new minihub (Metroplex).
Other regional sorting centers are planned.

Aircraft Types: DC-10-10CF
B-727
Cessna 208

Local Operations: Flights to/from Memphis hub.

Objectives: To protect its position as the largest small package express carrier by expanding geographic coverage and capacity to meet strong demand while introducing electronic Zapmail to move documents electronically.

Operating Requirements: For nonhub stations, similar to UPS requirements. Regional sorting centers (metroplexes) will require substantially more space.

Contacts:* Byron Hogue, Vice President (Government Affairs)

*Other contacts requested that their identities be withheld.

EMERY

Type: Freight Forwarder and Package Express

Scope: Domestic: Small package express
International: Freight forwarding and air cargo

Hubs: Dayton

Aircraft Types: DC-8
B-727
Miscellaneous turprop and piston aircraft

Local Operations: Daily service to its hub.

Operating Requirements: Currently uses only apron area at STL with facilities off-airport, but generally would prefer to be on airport.

Contacts: Identities withheld by request.

FLYING TIGERS

Type:	All-Cargo
Scope:	Domestic: Nationwide International: Worldwide
Hubs:	Columbus, Ohio (Opened April 1986) Los Angeles International New York/Kennedy
Aircraft Type:	B-747F B-727
Local Operations:	Daily Cargo Service at STL
Objectives:	To provide shippers with on-line air cargo services worldwide; substantial use of trucking; strong interest in protecting interior U.S. points from foreign carrier penetration.
Operating Requirements:	Requires adequate ramp space and cargo terminal facilities to permit efficient loading, sorting, and unloading for aircraft and trucks; must be able to conduct nighttime operations.
Contacts:	Identities withheld by request.

JAPAN AIRLINES/KOREAN AIRLINES/NIPPON ALL-CARGO

Type: Foreign

Scope: Extensive Asian operations plus services to many parts of the world. (Note: Discussed only cargo operations.)

Hubs: Tokyo (JAL, NAC)
Seoul (KAL)

Aircraft Type: B-747F

Local Operations: None by air; some truck service (connecting to air) is offered.

Objectives: Access to central U.S. industrial markets, preferably via Chicago.

Operating Requirements: Adequate runways to accommodate 747-F, plus cargo facilities, aprons, etc., sufficient to handle large cargo movements efficiently.

Note: All of these carriers are seeking access to Chicago. Since intergovernmental negotiations have been initiated to obtain those rights, none would indicate a willingness to serve another point in the midwest for fear of undercutting their negotiating positions.

Contacts: Identities withheld by request.

NORTHWEST

Type:	Major
Scope:	Domestic: Nationwide International: Asia/Europe (London, Scotland, Scandinavia and Germany)
Hubs:	Minneapolis Memphis (if Republic acquisition succeeds) Detroit (if Republic acquisition succeeds)
Aircraft Types:	B-747 DC 10-40 B-767 B-727 B-757 (order) DC 9 (Republic) MD-80 (Republic)
Local Operations:	Nonstop service to Minneapolis (NWA) Memphis and Detroit (Republic)
Objectives:	Strengthen domestic system to counteract United's entry into its Pacific markets; Republic acquisition (if approved) provides small aircraft and feed which must be integrated with NWA's long haul operations.
Operating Requirements:	Limited at STL.
Contacts:	William Kutzke, Vice President, Airline Planning

PEOPLE EXPRESS/FRONTIER

Type: Large National

Scope: Domestic: Nationwide
International: Canada and Europe (London and Brussels)

Hubs: Newark (PE)
Denver (Frontier)

Aircraft Types: B-747
B-727
B-737
MD-80 (Frontier Only)

Local Operations: Multiple daily flights to Newark and Denver.

Objectives: To provide nationwide low cost/low fare service through its Newark and Denver hubs. Acquisition of Britt should strengthen both carriers at St Louis and Chicago by providing on-line feed.

Operating Requirements: Unique PE service (on board ticketing, carry on luggage) minimizes its facilities requirements at STL. Could face some facility constraints if it seeks to build up Britt-PE-Frontier complex.

Contacts: Robert McAdoo
Chief Financial Officer

TWA

Type: Major

Scope: Domestic: Nationwide
International: Europe and Mid-East

Hubs: St. Louis/Lambert
New York/Kennedy

Aircraft Types: B-747
L1011
B-767
B-727
MD-80
DC-9 (Ozark)

Local Operations: TWA is the largest operator at STL; Ozark is second.

Objectives: At STL, strengthen the hub by adding flights and destinations, particularly to smaller markets. Ozark acquisition will provide both access to those smaller markets and a chance to improve utilization of the combined TWA/Ozark fleet.

At JFK, strengthen international feed.

Operational Requirements: Satisfied with STL and JFK

Contacts: Sanford B. Rederer
Vice President Strategic Planning

UPS

Type: All-cargo, small package

Scope: Extensive coverage in U.S., Canada, plus coverage in Europe and in some other major international destinations.

Hubs: Louisville
Philadelphia (announced)

Aircraft Types: B-747
DC-8-70
B-727
Assorted smaller aircraft

Local Operations: Daily flights to/from hub, plus extensive local trucking.

Objectives: Not publicly stated. But UPS appears to be moving to (a) expand market coverage, particularly internationally; (b) make greater use of UPS-owned aircraft (rather than buying space on airlines); and (c) to increase the maximum package size it will accept.

Operating Requirements: Hub operations at Louisville require 450,000-500,000 square feet of hubbing space plus 120 acres of ramp to accommodate large number of simultaneous aircraft loading and unloading operations; Philadelphia will have a 500,000 square foot building on a 200 acre site; strong preference for two runways (as insurance against hub disruption); Louisville had 65 aircraft arrivals per night and 25 per day in late 1985; ample space also required for employee parking and some truck access.

Unrestricted nighttime operations are critical.

Nonhub points like STL require adequate building and ramp space to permit aircraft to truck loading/unloading

Contacts: Doug Kuelpman
UPS, Louisville

UNITED

Type: Major

Scope: Nationwide, Asia, and South Pacific, Mexico and Caribbean

Hubs: Chicago
Denver
Dulles (May 1, 1986)
San Francisco
Los Angeles

Aircraft Types: B-747
DC-10-10 and 109-30
B-767
DC-8
B-727
B-737

Local Operations: Multiple daily flights to Denver and Chicago

Objectives: To divert St. Louis feed traffic over United's existing hubs by providing better service and by using new Pacific routes to increase its share of travelers now flying via St. Louis.

Operating Requirements: Gates are the principal concern; delays hurt (but hurt TWA and Ozark more)

Contacts: Identities withheld by request.

WESTERN

Type:	Major
Scope:	U.S., Canada and Mexico; emphasis on Western U.S.
Hubs:	Salt Lake City Los Angeles
Aircraft Types:	DC-10 B-737 B-727
Local Operations:	Two nonstops per day to Salt Lake
Objectives:	To be the predominant carrier in the Western United States.
Operating Requirements:	Western's small scale of operations at St. Louis is easily satisfied by Lambert.
Contacts:	William Semos, Vice President, Marketing

ZANTOP

Type: All-cargo, scheduled and charter

Scope: Domestic

Hub: Detroit (Willow Run)

Aircraft Types: DC-8
Convair 640
DC-6
L-188

Objectives: Become an integral part of the automobile industry's extended production line by providing the highly reliable service essential to operate just-in-time manufacturing systems.

Operating Requirements: Prefers larger (and better) ramp facilities than are available at STL. Convenient access to large customers such as forwarders and auto plants is essential.

Contacts: Larry Broadhurst
Vice President, Cargo, Sales and Service

Appendix 3.1 A Profile of Existing Services at Lambert/St. Louis International

3.A.1 Size and Activity

Lambert/St. Louis International (STL), located 10 miles northwest of St. Louis, serves the nine county Standard Metropolitan Statistical Area (SMSA) of Franklin, Jefferson, St. Charles, St. Louis Counties, and St. Louis City in Missouri and Clinton, Madison, Monroe and St. Clair Counties in Illinois. The total population within this nine county area is 2.4 million, whose median age is 32. Population is expected to be 2.5 million by the year 2000, a 5.8 percent increase over 1983. Per capita income, in 1972 dollars, is forecasted to be \$7,786 by the year 2000, a 31 percent increase over 1983.

The Lambert hub is one of 26 large hubs in the U.S. Based on 1983 data, STL ranked 11th in the U.S. in total enplaned passengers (2.3 percent of the U.S. total), and 13th in total aircraft operations (0.6 percent of the U.S. total). As shown in Table 3-A, Lambert in 1983 handled 7.6 million passenger enplanements and 69,676 tons of enplaned cargo and mail. Between 1985 and 1995, the FAA forecasts St. Louis enplanements to increase to 12.1 million. By the year 2000 St. Louis enplanements should reach 13.9 million passengers. Enplaned cargo and mail for the same 1985 to 1995 period are forecast to increase to 102,925 tons, a 40 percent growth, reaching 119,841 tons by the year 2000 (See Table 3-A).

The Federal Aviation Administration maintains a Terminal Area Forecast (TAF) for a large number of airports in the United States. This document presents eight years of historical data for passenger and aircraft operations, and eleven years of forecast. (See Table 3-A for FAA data and the survey team's forecast for 1995 and 2000.) In addition, the TAF maintains a

Table 3-A
 LAMBERT/ST. LOUIS INTERNATIONAL
 ACTIVITY AND FORECAST

Enplaned Passengers (000)			Scheduled Airline Enplaned Revenue Tons					Aircraft Operations (000)				
Year	Air Carrier	Air Taxi/ Commuter	Total	Freight	Express ⁴	U.S. Mail	Total Cargo & Mail	Air Carrier	Air Taxi/ Commuter	General Aviation	Military	Total
1970 ¹	4,619	82	4,671	28,740.85	412.89	21,332.00	50,486.54	190	39	101	10	340
1979 ¹	5,518	58	5,576	19,613.95	439.55	24,462.91	44,516.41	204	35	95	8	342
1980 ¹	5,322	71	5,393	26,352.43	400.68	21,926.83	48,679.94	200	43	85	8	337
1981 ¹	5,190	73	5,272	18,120.56	358.06	24,961.15	43,439.77	194	45	74	7	320
1982 ¹	5,644	175	5,819	18,781.08	320.86	27,994.03	47,095.97	179	45	58	8	290
1983 ¹	7,528	90	7,626	33,141.07	331.45	36,103.62	69,576.14	228	51	58	8	343
1985	8,391	116	8,507	34,694.07	251.71	38,867.82	73,813.60	260	72	52	8	392
1990	10,007	175	10,183	41,632.88	264.30	45,778.11	87,678.29	282	96	40	8	426
1995	11,934	223	12,156	49,959.46	277.51	45,778.11	102,925.49	294	127	31	8	460
2000	13,607	279	13,886	59,951.35	291.39	59,598.87	119,841.61	314	164	19	8	505

NOTES:

All cargo airlines account for 9% of all enplaned freight and 13% of deplaned freight, 1983-2000

Ratio of enplaned to deplaned cargo tonnage: Freight and express 0.904; mail 1.099.²

Ratio of connecting to enplaned passengers 0.40: 1

Ratio of generated to enplaned passengers 0.39: 1³

Ratio of returning to enplaned passengers 0.21: 1³

¹Source: FAA Terminal Area Forecasts and FAA/CAB Airport Activity Statistics

²Source: TSC Large Hub Forecasts pp. 76 and 77

³Source: DOT-TSC 1182 Airline Hub Domestic Activity, December 1976

⁴Does not include data for small package express carriers such as Federal Express, UPS, etc.

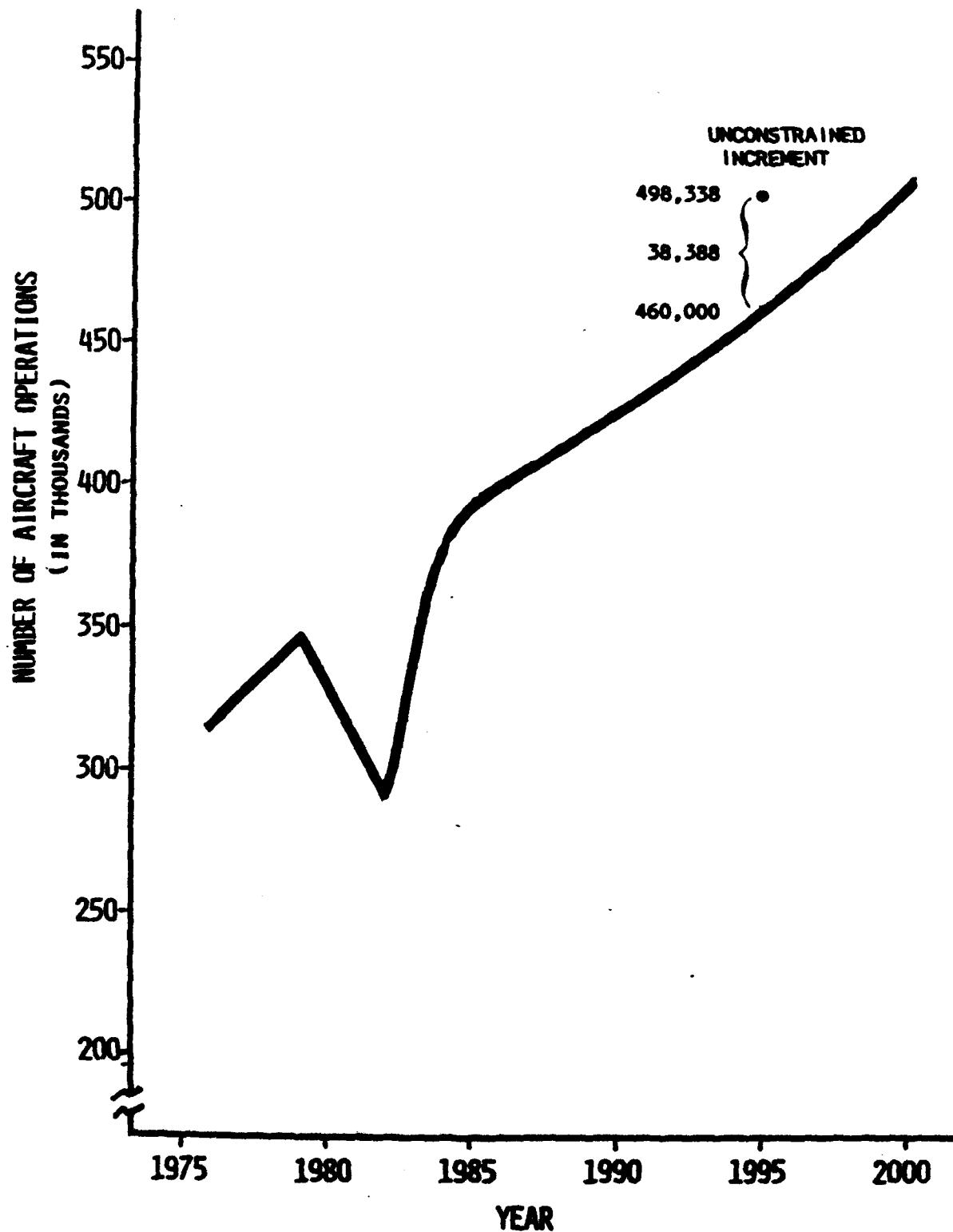
list of airports nearing saturation prior to 1996 as well as other constrained airports. Lambert/St. Louis is listed as being saturated at 396,900 aircraft operations, and is forecast to have over 460,000 operations in 1995. The FAA believes that aircraft operations at Lambert would be 498,338 in 1995 with unconstrained growth (see Figure 3-A). Recently released figures on Lambert's actual performance in 1985 indicate that aircraft operations exceeded forecasts by 5 percent, reaching 411,288 - the level of operations forecast for 1988.

3.A.2 Current Service

As discussed earlier, growth of air traffic at STL has been remarkable. The airport is now served by 17 scheduled passenger carriers also carrying freight and mail as "belly cargo". This is an increase of 9 carriers since 1978 (See Table 3-B). Flying Tigers and Zantop are the two all-cargo certified route air carriers which serve St. Louis. TWA and Ozark account for the majority of the arriving and departing traffic. In 1983 STL had a total of 124,612 departures by scheduled airlines. TWA accounted for 45 percent of those departures, averaging 156 departures per day. Ozark accounted for 31 percent, averaging 106 departures per day. At the hubs examined, only Delta with 303 and Eastern with 276 departures at Atlanta, American with 254 at Dallas-Fort Worth, and United with 228 at Chicago-O'Hare averaged more departures in 1983 than TWA at St. Louis.

TWA offers service from STL to 62 continental U.S. and 24 overseas destinations. Non-stop service is provided daily to London, England, Frankfurt, Germany, Paris, France, the Bahamas, and Puerto Rico. Ozark provides service to 61 continental U.S. destinations and the Bahamas, and Ozark and TWA are direct competitors for St. Louis passengers at 36 airports.

Figure 3-A
LAMBERT/ST. LOUIS INTERNATIONAL



SOURCE: AIRCRAFT OPERATIONS, 1985 TERMINAL FORECASTS, FAA

Table 3-B

Lambert/St. Louis International Airlines and Enplaned-Passengers

	1978	1979	1989	1981	1982	1983	1985
American	557,878	723,119	661,860	435,010	172,749	180,816	Yes
Allegheny	164,050	155,132	140,697	99,112	75,272	60,949	Yes
Braniff	10,023	24,184	70	--	--	--	No
Delta	404,073	447,264	399,950	294,574	214,004	213,860	Yes
Eastern	490,079	594,663	410,481	241,646	200,153	160,880	Yes
Ozark	972,168	887,192	1,042,433	1,341,893	1,648,003	1,994,542	Yes
Southern	117,958	44,730	(Repub11c)	(Repub11c)	(Repub11c)	(Repub11c)	-
TWA	1,856,176	2,423,020	2,333,273	2,357,539	3,079,709	4,708,222	Yes
Frontier	--	154,608	130,689	124,835	102,235	87,822	Yes
Northwest	--	53,812	41,290	39,083	40,246	56,936	Yes
Republic	--	36,559	83,098	91,308	89,981	78,204	Yes
						(Continental)	
Texas International	--	38,210	55,205	49,428	42,108	1,237	No
Midway	--	--	12,445	44,220	54,201	53,650	
		198	(Air Midwest)	(Air Midwest)	(Air Midwest)	(Air Midwest)	
Mississippi Valley	--		7,989	7,486	6,946	7,498	Yes
Continental	--	--	--	--	9,648	50,966	No
Pan American	--	--	--	--	--	1,237	Yes
Jet America	--	--	--	--	--	10,445	Yes
United	--	--	--	--	--	76,158	Yes
Air Illinois	--	--	--	--	--	71,298	No
Western	--	--	--	--	--	1,907	Yes
Southwest	--	--	--	--	--	--	Yes
Britt	--	--	--	--	--	--	Yes
Piedmont	--	--	--	--	--	--	Yes

Source: Airport Activity Statistics of Certified Route Air Carriers
1978 through 1983
DOT-CAB

3.A.21 Distribution of Passenger Traffic, Two City Pair Origin and Destination

The New York City area, including La Guardia, Newark and John F. Kennedy airports, has the most frequent non-stop service from St. Louis, with a total of 15 (14 inbound to St. Louis) non-stop flights on week-days, and 11 (8 inbound) non-stop flights per day on weekends. In 1984, 472,270 passengers flew the St. Louis-New York and New York-St. Louis routes (See Table 3-C); 12 percent of these passengers used St. Louis as a connecting point. TWA carried 73 percent of these New York passengers and Ozark carried 9 percent.

The Washington, D.C. area receives the next highest frequency of TWA service from St. Louis with a total of 12 non-stop flights (7 inbound) on weekdays, 10 (6 inbound) on weekends. The 1984 passenger load on this route structure was 232,160, of which 14 percent were connecting passengers. TWA carried 66 percent of the total, and Ozark carried 21 percent.

The Los Angeles areas and Kansas City are the third most frequent non-stop destinations with 10 TWA flights each. The Los Angeles area routes carried 266,680 passengers in 1984, of which 12 percent were connecting passengers. TWA had 49 percent of the market; Ozark does not service Los Angeles. The Kansas City routes serviced 249,730 passengers, 23 percent of which were connecting through the St. Louis hub. TWA has 43 percent of this market and Ozark has 37 percent.

For the Chicago routes Ozark is dominant, with 15 flights on weekdays, and 8 on weekends. TWA has 8 flights daily. 691,280 passengers flew this route in 1984, 17 percent of which were connecting passengers. Ozark had 49 percent of the market, and TWA has 22 percent.

Table 3-C

STL Passenger Traffic to Major U.S. Cities - 1984 1/STL TOP MARKETS 2/

	<u>OUTBOUND/INBOUND TOTAL</u>	<u>CONNECTING TOTAL</u>
Chicago	691,280	115,230
New York	472,270	51,270
Dallas/Ft. Worth	369,310	64,050
Los Angeles	266,680	32,001
Purbank		
Long Beach		
Ontario		
Kansas City	249,730	56,430
Washington, D.C.	232,160	34,270
Denver	220,050	37,620
Houston	193,110	19,100
Atlanta	180,070	45,840
Minneapolis	176,810	37,060
Las Vegas	148,210	8,490
Detroit	146,380	19,290
San Francisco	121,080	20,120
San Jose		
Oakland		
Philadelphia	112,580	18,140
Boston	100,600	14,720
Baltimore	51,880	8,260

1/ All passenger figures are based on 10 percent samples.2/ A total of 315 origins/destinations were identified by the survey.

Source: Civil Aeronautics Board Origin-Destination Survey of
 Airline Passenger Traffic Domestic Table 10, Fourth Quarter
 1984.

3.A.3 Cargo at Lambert

Lambert-St. Louis International currently has three separate cargo areas. Cargo City is on the passenger terminal side of the airport, serving aircraft which park at the passenger gates. The Air Terminal Services (ATS) cargo area serves a mixture of all-cargo and small package express carriers. The Saberliner area is used mainly by small package express carriers. These latter cargo areas are across the parallel runways from the passenger terminal.

The ATS area covers approximately 50 acres and, according to the Lambert sponsored study "Air Cargo Analysis", has current structures which may be in violation of approach areas and clear zones to runway 12L. If so, any further construction or apron expansion probably would be discouraged by the FAA. The Saberliner, or Northeast site, has 15 acres, which is sufficient for the Air Cargo Analysis tonnage requirements, but is not adequate for a small package express hub or a combined small package express hub and auto parts distribution center. The St. Louis sponsored Air Cargo Analysis reached the same conclusion:

All Cargo Carrier Requirements

"Many of the freight forwarders currently use St. Louis as a feeder to larger hub operations located at other airports around the country. Although a few carriers have shown interest in developing hub operations at St. Louis, environmental considerations and the focus of Lambert as a passenger facility may limit such development. This is particularly true for any operation that would result in a major increase in nighttime or peak period aircraft activity (i.e., beyond that which is predicted to occur from normal growth trends)... However, careful consideration should be given to the regional economic impact of not providing for future local air cargo needs...

The study team agrees with the need identified in the Air Cargo Analysis for improved cargo facilities in the St. Louis area. Interviews with small package express officials during this survey reinforced the inadequacies of the Lambert for a cargo hub operation.

For combination passenger and cargo movements, Lambert has sufficient cargo capacity in the Cargo City area. Cargo City has a total land area of 850,351 square feet of which 134,338 square feet are covered area. The remainder includes truck docking areas, staging areas, automobile parking lots and tug drives. As there is no apron area available for aircraft parking in the immediate proximity of Cargo City, it does not lend itself to either all-cargo or small package express use. Forecasts for freight and express cargo in the belly hold of passenger flights is 54,847 enplaned tons for the year 2000. The recognized empirical rule for air cargo terminal planning is the allocation of one square foot of building space for each enplaned ton of cargo per year. By the year 2000, Cargo City can still provide approximately 2.5 square feet per annual enplaned ton of belly hold cargo, for planes parked on the passenger terminal apron. (As a general rule, approximately 35 percent of the actual aircraft belly hold weight capacity is utilized.)

The parallel runways at STL are 1,700 feet apart, thus cannot accommodate independent simultaneous Instrument Flight Rule (IFR) traffic. This creates an air-side constraint, as does the physical location of the terminal facilities with relation to the runways which requires crossing active runways for take-off and landing. The interstate highway network, McDonnell-Douglas production facility, a cemetery, housing and industrial complexes are incorporated into the current airport boundary. These latter conditions are ground-side constraints which would be difficult to alter. Lambert is scheduled to

have multiple category II ILS capability within the next year. This will allow landings under less favorable weather conditions but will not necessarily increase the rate of traffic flow. Installation of high technology landing systems at Lambert cannot be expected until at least 1990. Even if technology improvements such as the Microwave Landing Systems (MLS), allow improved traffic flow while airborne, ground space is likely to become the limiting factor.

Appendix 10.1 Automobile Industry Impacts

Economic growth in the St. Louis area can be attributed in large measure to the aircraft industry plus the "Big Three" automobile manufacturers which operate a total of 11 shifts at 5 assembly operations in or near St. Louis. These include General Motors plants in St. Louis and Wentzville, two Chrysler plants in Fenton, and Ford in Hazelwood. According to a December 1985 document entitled Automobile Parts Industry Opportunities in the Southwestern Illinois Region of the St. Louis Metropolitan area, "the Midwest motor vehicle production area encompasses 43 facility locations. Facilities at these locations are owned and operated by General Motors Corporation, Chrysler Corporation, Ford Motor company, Nissan, U.S. Honda, American Motors, and various other smaller producers (e.g., International, Kenworth, Peterbilt, etc.). The facilities produced over 9.651 million vehicles in 1984 model year. Four new assembly facilities are expected to be operational by 1989. They include: (1) the proposed \$600 million dollar Chrysler-Mitsubishi facility in Bloomington, Illinois; (2) the General Motors (Saturn) facility in Springhill, Tennessee; (3) the General Motors truck assembly plant in Fort Wayne, Indiana; and (4) the Toyota Motors facility in Georgetown, Kentucky. All of the existing and new assembly plants at these Midwest locations are within 500 miles of the St. Louis/Southwestern Illinois market area." Since 1980, over a \$1.6 billion investment has been made by the Big Three for plant construction and renovation in the State of Missouri. These activities have prompted Department of Commerce officials to conclude that there is a trend toward movement of automobile assembly operations "back to the Midwest." (See Figure 10-A).

Figure 10-A



Table 10-A
Auto Parts Industry
Southwestern Illinois/St. Louis Region ^{1/}

<u>Region</u>	<u># of Establishments</u>	<u>Employment</u>	<u>Sales</u>
Madison County	12	260	\$ 14,741,800
St. Clair County	8	49	1,623,000
St. Louis Region	81	8,653	523,782,800

^{1/} Includes industries in the following SIC Codes: 2271, 2396, 2399, 2531, 3011, 3041, 3079, 3465, 3493, 3519, 3592, 3647, 3691, 3694.

Source: State of Illinois - Department of Commerce and Community Affairs; Dunn & Bradstreet File, November 1985.

It is estimated that the fourteen state midwestern region of Illinois, Missouri, Georgia, Indiana, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Ohio, Oklahoma, Tennessee, Texas, and Wisconsin has in excess of 4,500 auto parts supply industries, employing over 857,000 people, with sales of \$76 billion (See Table 10-B).

Table 10-B
Auto Parts Industry
Southwestern Illinois/St. Louis Region ^{1/}

<u>State</u>	<u># of Establishments</u>	<u>Employment</u>	<u>Sales (\$ million)</u>
Illinois	1,482	102,133	\$ 13,952
Missouri	139	20,970	827
Georgia	158	23,910	618
Indiana	348	109,572	4,849
Kansas	63	6,962	238
Kentucky	92	21,121	553
Louisiana	24	6,673	115
Michigan	804	234,908	16,820
Minnesota	122	13,913	1,071
Ohio	599	181,455	31,210
Oklahoma	56	14,256	352
Tennessee	156	30,522	610
Texas	349	42,287	1,541
Wisconsin	<u>205</u>	<u>49,035</u>	<u>3,884</u>
TOTAL	4,597	857,717	\$ 76,621

^{1/} Includes Industries in the following SIC Codes: 2271, 2396, 2399, 2531, 3011, 3041, 3079, 3465, 3493, 3519, 3592, 3647, 3691, 3694.

Source: State of Illinois - Department of Commerce and Community Affairs; Dunn & Bradstreet File, November 1985.

Derived from: Automobile Parts Industry Opportunities in the Southwestern Illinois Region of The St. Louis Metropolitan Area, December 1985.

Recent efforts to attract automobile parts manufacturers and distributors to Southwest Illinois should be greatly enhanced by the Scott AFB proposal, especially if a small package express carrier and an all cargo carrier are attracted to this location. The Magna International Plant at Nashville, Illinois is a good start. Overseas sourcing and domestic parts production are not necessarily mutually exclusive. A discussion with an airline official indicates there were two B-747 F's, loaded with Detroit-made clutches, which flew to Tokyo. Scott AFB could be a vital addition to an automotive corridor plan of the State of Illinois.

Automobile parts account for approximately 80 percent of the inbound freight of all-cargo airlines which transit St. Louis. In addition, there are 68 separate firms in the St. Louis area who provide automobile parts to nationwide, as well as St. Louis, locations. Approximately 70 percent of all-cargo airlines outbound freight from St. Louis is associated with the automobile industry.

"A Competitive Assessment of the U.S. Automotive Parts Industry", published by the U.S. Department of Commerce in March 1985, estimates that the 1983 market for original equipment replacement parts and products for automobiles and light trucks was \$70 billion in 1983 dollars that replacement parts for Japanese vehicles will rise at an annual rate of 9.5 percent during the 1980's, increasing in value from \$1.4 billion in 1982 to \$2.2 billion in 1988 (1982 dollars). Retail price will be \$3.4 billion. By contrast, the demand for replacement parts for U.S. made vehicles will grow at only one per cent per year. Currently, over half the replacement parts for Japanese vehicles flow through original equipment distribution networks. By 1990, this is expected to drop to 25 percent.

Japan accounts for over 80 percent of all automobile parts shipments to the U.S. from the Pacific basin, however, Korea and Taiwan increased their share between 1982 and 1983 by 41 percent and 120 percent (\$103 million and \$196 million) respectively. In two years, the United States went from a parts trade surplus of \$1.3 billion in 1981, to a parts trade deficit of \$1.9 billion in 1983.

Another study by the Department of Commerce entitled, "The U.S. Motor Vehicle and Equipment Industry, Since 1958" also predicts increased imports of auto components. The study states "...the major car manufacturers have been looking increasingly either to foreign companies or to their own foreign-based subsidiaries and plants as a cheaper source of parts and equipment; particularly those located in Korea, Japan, Mexico, and Brazil.by the end of 1985 foreign suppliers will capture 26 percent of the auto components business, rising to 36 percent by 1990." 36 percent of approximately \$72 billion means a business of about \$26 billion per year.

The "just-in-time" inventory system now being widely accepted, the concentration of assembly plants in the midwest area, the geographic location of Scott, and the out-sourcing of components, could be a bonus catalyst for Scott AFB as a joint-use facility. "Just-in-time" is a system whereby suppliers are required to deliver parts and materials just-in-time to meet production schedules, which reduces large inventory and warehousing costs.

The study team believes that an industrial park with a domestic and foreign auto parts distribution center near the expanded Scott AFB facility needs serious consideration. This center could be served by foreign and U.S. airlines from the

Far East, as well as from Brazil and Mexico. Such a facility could attract domestic all-cargo carriers and even small package express carriers who would handle the domestic distribution. (See Tables 10-A and 10-B).

Air Transport Association data indicates that U.S. air carrier imports to the United States included 27,150 tons of motor vehicles and parts in 1983. This was 2.4 percent of the total import tonnage on U.S. carriers and was the tenth leading category by weight. In effect, Scott AFB, under joint-use criteria, could become a distribution hub for a growing auto parts industry.. This, in turn, could lead to the establishment of a foreign trade zone which might help relieve some of Chicago's airport system capacity problems.

Appendix 12.1 Derivation of Operating Revenues Expenses and Profits

The lack of either a comprehensive comparative airport financial data base or proven operating ratios for predicting airport revenues, expenses and net income required IPAC to develop its own data base to estimate the range within which Scott AFB operating revenues, expenses and profits might fall during the period 1990 to 2005. The survey team data base was derived from the Airport Operators Council International (AOCI)^{1/} traffic projections, airport financial data, and a survey team telephone survey of airports.

Airports represented in the sample were chosen to replicate the range of traffic levels predicted for Scott AFB over the years 1990 to 2005. The AOCI traffic data is for calendar year 1984. Financial data collected through the IPAC Survey cover each airport's fiscal year most closely approximating calendar year 1984.

Using this data, average operating revenues, expenses and profits were calculated on a per passenger, per total operation (military, general aviation and commercial) and per commercial operation basis. Revenue and expense estimates for Scott were then calculated by multiplying the mean figures for revenues and expenses by the projected levels of traffic.

Since the Scott forecast is based on joint use (military and civilian) with a high concentration of military flights in the early years, estimates of financial results based on total operations were not considered reliable. Results are thus reported on a per passenger and per commercial operation basis.

^{1/} Traffic Projections Calendar Year 1984, Airport Operators Council International.

The mean figures for revenues and expenses from the sample airports were:

Revenue/Passenger = \$4.57	Revenue/Commercial Operation = \$110.32
Expense/Passenger = 3.49	Expense/Commercial Operation = 82.73
Operating Profit/ Passenger = 1.08	Operating Profit/Commercial Operation = 27.59

Applying these figures to the traffic levels forecast for Scott for the period 1990 to 2005, produced the revenues, expense and operating profit levels summarized in five-year increments in Table 12-A. These revenue forecasts were then checked by separately estimating anticipated airport revenues based on analysis of landing fees at Scott and other airports (See Appendix 12.2).

The results summarized in Table 12-B show that revenue estimates based on landing fee projections correspond closely to the revenue forecasts used in the financial analysis.

A similar check was developed for the expense forecasts. In this case the experience of two existing joint use airports provided an alternative method for estimating operating expenses. The average expense to the airport per civil operation for airfield-related charges at Westover AFB and Rickenbacker AFB were \$16.60 and \$22.00; respectively. In the case of Westover AFB, expense data is available for reimbursements to the Air Force which correlate directly to civil operations.

These included expenses for:

- o Airfield
 - operations and maintenance
 - snow removal
 - sweeping

Table 12-A
Scott AFB Projections
(\$ million 1984)

Based on Passengers

	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>
Operating Revenues	0.55	1.74	6.69	12.84
Operating Expenses	0.42	1.33	5.11	9.81
Operating Result	0.13	0.41	1.58	3.03

Based on Commercial Operations

Operating Revenues	1.32	2.18	5.54	8.63
Operating Expenses	0.99	1.64	4.15	6.47
Operating Result	0.33	0.54	1.39	2.16
 # Passengers	 121,000	 381,000	 1,464,000	 2,810,000
# Commercial Operations	12,000	19,800	50,200	78,200

Table 12-B
Operating Revenue Analysis
(\$ million 1984)

	Forecast Operating Revenue		Estimated Operating Revenue
	Based on Passengers	Based on Commercial Operations	Based on Landing Fees
1990	0.5	1.3	0.07
1995	1.7	2.2	1.8
2000	6.7	5.6	6.4
2005	12.8	8.6	12.8

o Air Traffic Control

The reimbursements are based on a percentage of total costs to be Air Force derived from the ratio of total civilian operations to total airfield operations. The 1981 percentage was 4.6 percent and total reimbursements approximated \$31,000.

Since Scott AFB, as a joint use facility, will neither be an exact duplication of the Westover experience, nor a straight commercial operation, an excursion analysis was done to ascertain the extent of the expense variance. The 1981 Westover expenses were converted to 1985 dollars, adjusted for less snowfall, and applied to Scott AFB using forecast traffic ratios to determine reimburseable costs. Management employees were started at the Horry County level, with the addition of police, and increased incrementally based on traffic and airport expansion. Terminal Operations and Maintenance (O&M) costs were based on new construction O&M costs as a percentage of total construction costs. After 1995, airfield O&M costs are based on full Westover AFB airfield O&M costs, adjusted for new construction. It was assumed that after 1995 O&M financial responsibility for the newly constructed runway would be with the civil management group.

The results shown in Table 12-B are indicative that significant savings should be available as a result of joint use.

Reimbursements at Rickenbacker AFB are a flat annual fee of \$150,000, regardless of the number of operations. The survey of airport financial data indicated that airfield-related charges for comparable airports range from roughly 33 percent to 20 percent of total operating expenses. An airfield charge at Scott of \$22 per operation would result in the total operating expenses shown in Table 12-C. The actual expense forecasts are shown for comparison.

Table 12-C
Operating Expense Analysis
(\$ million 1984)

	Airside Expenses		Forecast Operating Expenses	
	20% of Total	33% of Total	Based on Passengers	Based on Commercial Operations
1990	0.7	0.4	0.4	1.0
1995	1.2	0.8	1.3	1.6
2000	3.6	2.4	5.1	4.2
2005	6.0	4.0	9.8	6.5

These results suggest that the study's forecast for operating expenses is conservative and could therefore overstate actual operating expenses. Rather than attempt ad hoc adjustments to the forecast it should simply be noted that forecast operating expenses may be somewhat overstated and forecast operating profits understated for the first five years of the forecast period.

Table 12-D
Scott AFB Revenue/Expenses
Based on Joint Use Expenses
(\$ million, constant 1985)

Year	REVENUES		EXPENSES					Net Airport Opera- tions Earnings
	Revenue Operations	Revenue Operations as % of Scott Tot.	Opera- tions Revenue	Airfield O&M	Air Traffic Control	Management Employees Payroll	Terminals O&M	
1988	00	00	\$ 0.00	\$0.000	\$0.000	\$0.15	\$0.00	\$ (0.15)
1989	00	00	0.00	0.000	0.000	0.32	0.00	(0.32)
1990	12,000	23	1.32	0.058	0.052	0.32	0.03	0.86
1991	13,264	25	1.46	0.063	0.060	0.50	0.03	0.81
1992	14,661	27	1.62	0.068	0.062	0.68	0.03	0.78
1993	16,206	29	1.79	0.073	0.066	0.86	0.03	0.76
1994	17,912	31	1.98	0.078	0.071	1.04	0.03	0.76
1995	19,800	33	2.18	0.064	0.075	1.22	0.39	0.43
1996	23,849	37	2.63	0.064	0.084	1.40	0.39	0.69
1997	26,726	42	3.17	0.064	0.096	1.58	0.39	1.04
1998	34,601	46	3.82	0.070	0.105	1.76	0.39	1.50
1999	41,677	51	4.60	0.170	0.116	1.94	0.39	1.98
2000	50,200	55	5.54	0.276	0.125	2.12	0.75	2.27
2001	54,854	58	6.05	0.276	0.132	2.30	0.75	2.59
2002	59,938	60	6.61	0.276	0.137	2.48	0.75	2.97
2003	65,494	62	7.23	0.276	0.141	2.66	0.75	3.40
2004	71,566	64	7.89	0.276	0.146	2.84	0.75	3.88
2005	78,200	66	8.63	0.276	0.150	2.97	1.07	4.72
TOTALS	602,948		\$66.52	\$2.428	\$1.618	\$27.14	\$6.92	\$28.97

Appendix 12.2 Survey of Landing Fees

A survey of landing fees for airports comparable in size to the forecast size of Scott found a range of fees from approximately \$.30 to more than \$.75 per 1,000 lbs of maximum gross landing weight. Based on a conservative estimate for landing fees of \$.45 per 1,000 lbs, total revenues were projected for Scott. Using a ratio of landing fees to total airport revenues derived from published sources and an analysis of airport financial and traffic data, total airport revenues were estimated for Scott and then compared to the forecast levels. These sources indicate that landing fees decline as a percentage of total revenues as an airport grows.

Tables 12-F and 12-G summarize the basis for the landing fee revenue projections. Table 12-F shows total airport revenues implied by this analysis for 1990, 1995, 2000 and 2005.

Table 12-E
Total Airport Revenues Based on Analysis of Landing Fees

	1990	1995	2000	2005
Landing Fees (% of total revenues)	20	17.5	15.0	15.0
Total Revenues with Landing Fees @ \$.45/1,000 lbs. (\$ million)	0.7	1.8	6.4	12.6
Forecast Revenues:				
Based on Commercial Operations (\$ million)	1.3	2.2	5.5	8.6
Based on Passenger (\$ million)	0.6	1.7	6.7	12.8

Table 12-F

LANDING FEE PROJECTIONS

NOTES:

TOTAL OPERATIONS=LANDINGS + TAKEOFFS.

ASSUMING LANDINGS=TAKEOFFS, LANDINGS HAVE BEEN
CALCULATED AS TOT.OPER./2.

CATEGORY: TYPE OF AIRCRAFT	MAX GROSS LANDING WGT (1,000 LBS)	1990	1995	2000	2005
ALL CARGO CARRIER:					
B747F	270.0	600	900	1500	2100
PACKAGE CARRIER:					
FALCONS	12.5	4500	6000	13000	15000
B-727	160.0	0	600	1500	6000
DC-8	250.0	0	0	600	1500
GENERAL AVIATION:					
TWINS	12.5	0	600	4000	7500
JET	12.5	0	0	4000	7500
COMMERCIAL AIRLINES:					
2 ENG NAR					
(B-757, DC-9, B-737)	137.0	300	1200	4500	8000
3 ENG NAR (B-727)	160.0	300	600	2200	3250
2 ENG WIDE (B-767)	270.0	0	0	300	1250
COMMUTER AIRLINES:					
2 ENG TUBOJET	12.5	300	300	750	1000
2 ENG JET	12.5	0	300	750	1000
TOTAL:		6000	10500	33100	54100

Table 12-G

LANDING FEE PROJECTIONS

NOTES:

TOTAL OPERATIONS=LANDINGS + TAKEOFFS.

ASSUMING LANDINGS=TAKEOFFS, LANDINGS HAVE BEEN
CALCULATED AS TOT. OPER. /2.

CATEGORY:	REV. FROM LANDING FEES: BASED ON FEE=\$0.45/1000 LBS. (\$0.45*(AIRCRAFT LAND. WGT/1000)*NUM. OF LANDINGS)			
TYPE OF AIRCRAFT	1990	1995	2000	2005

ALL CARGO CARRIER:				
B747F	\$72,900	\$109,350	\$182,250	\$255,150
PACKAGE CARRIER:				
FALCONS	\$25,313	\$33,750	\$73,125	\$84,375
B-727	\$0	\$43,200	\$108,000	\$432,000
DC-8	\$0	\$0	\$67,500	\$168,750
GENERAL AVIATION:				
TWINS	\$0	\$3,375	\$22,500	\$42,188
JET	\$0	\$0	\$22,500	\$42,188
COMMERCIAL AIRLINES:				
2 ENG NAR				
(B-737, DC-9, B-737)	\$18,495	\$73,980	\$277,425	\$493,200
3 ENG NAR (B-727)	\$21,600	\$43,200	\$158,400	\$234,000
2 ENG WIDE (B-767)	\$0	\$0	\$36,450	\$151,875
COMMUTER AIRLINES:				
2 ENG TUBOJET	\$1,688	\$1,688	\$4,219	\$5,625
2 ENG JET	\$0	\$1,688	\$4,219	\$5,625

TOTAL:	\$139,995	\$310,230	\$956,588	\$1,914,975